

JOURNAL

OF THE

AMERICAN VETERINARY MEDICAL ASSOCIATION

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Volume 126

MAY 1955

Number 938

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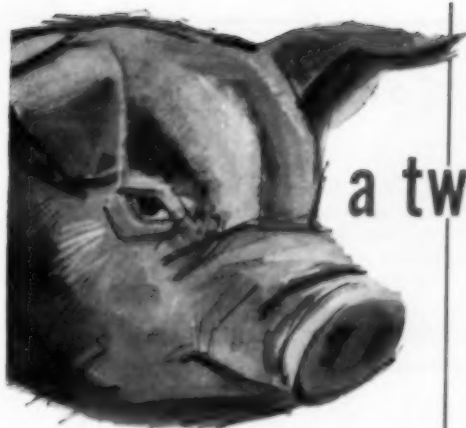
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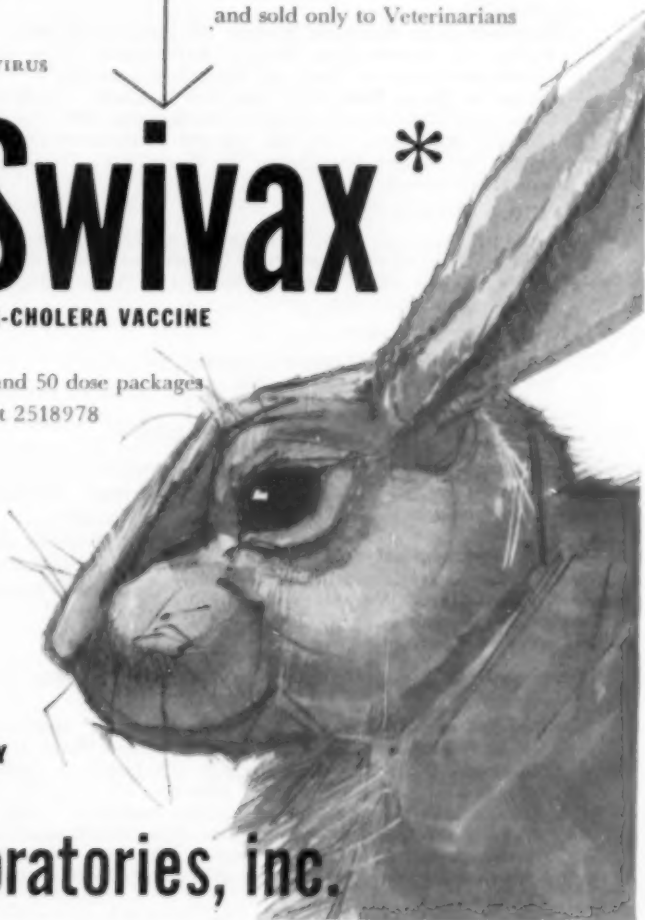
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References

- Nutritive Requirements of the Cat: A Preliminary Report — *Veterinary Medicine* Vol. XLVIII, No. 11, pp. 451-456, Nov. 1953.
Nutritive Requirements of the Cat, II, *Veterinary Medicine*, Vol. XLIX, No. 2, pp. 85-86.
Proceedings of the American Animal Hospital Association, New York Meeting, May, 1954.

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AVMA ☆ Report

--- Veterinary Medical Activities ---

◆ Assistant Executive Secretary Kingman participated in the Third Annual Career Conference sponsored by the Chicago Technical Council of the Illinois Institute of Technology on March 26, and the meeting of the American Medical Association Council on National Defense, April 2, 1955.

★ ★ ★

✓ Thirty-four officers of the Army and Air Force Veterinary Corps, who attended the Dairy and Meat Hygiene School at the Quartermaster Depot, visited Association headquarters on April 18, 1955. Members of the AVMA staff spoke to the group on the organization and activities of the Association and other professional matters.

★ ★ ★

◆ The Fellowship Committee of the Research Council (Drs. R. Getty, L. C. Ferguson, A. Gordon Danks, T. Lloyd Jones, D. K. Detweiler, C. A. Brandy, and C. H. Cunningham) met at Association headquarters on April 25 and considered a number of applications.

★ ★ ★

◆ The following AVMA Special Committees met at Association headquarters during April: the Committee on Brucellosis (Drs. J. L. McAuliff, chairman; Hugh S. Cameron, Francis H. Fox, A. K. Kuttler, P. G. MacKintosh, A. M. Orum, L. A. Rosner, V. D. Stauffer) on April 11-12; the Committee on Food and Milk Hygiene (Drs. C. H. Pals, chairman; J. W. Cunkelman, Raymond J. Helvig, Norman A. Fish, R. Allen Packer, E. J. Rigby, H. J. Stafseth, and Colonel John L. Owens) on April 13-14; and the Committee on Veterinary Service (Drs. I. D. Wilson, chairman; H. E. Kingman, Jr., Lewis A. Dykstra, E. J. Frick, Warren J. Kilpatrick, Charles C. Rife, and J. T. Schwab) on April 14-15.

★ ★ ★

◆ President A. H. Quin appeared on the program of the Washington State College Spring Conference held at Pullman on April 4-6.

★ ★ ★

◆ President-Elect Floyd Cross appeared on the program of the Southwestern Iowa V.M.A. at Council Bluffs on April 5, 1955.

★ ★ ★

◆ Assistant Executive Secretary Kingman presented the subject "Veterinary Public Relations" to the Army Medical Service Graduate School, Walter Reed Hospital, Washington, D.C., April 8, 1955.

★ ★ ★

◆ John McLaren and Howard Hass representing Fairall and Company, AVMA public relations counselors, met with AVMA staff members in the central office on March 31 to discuss the AVMA public relations program.

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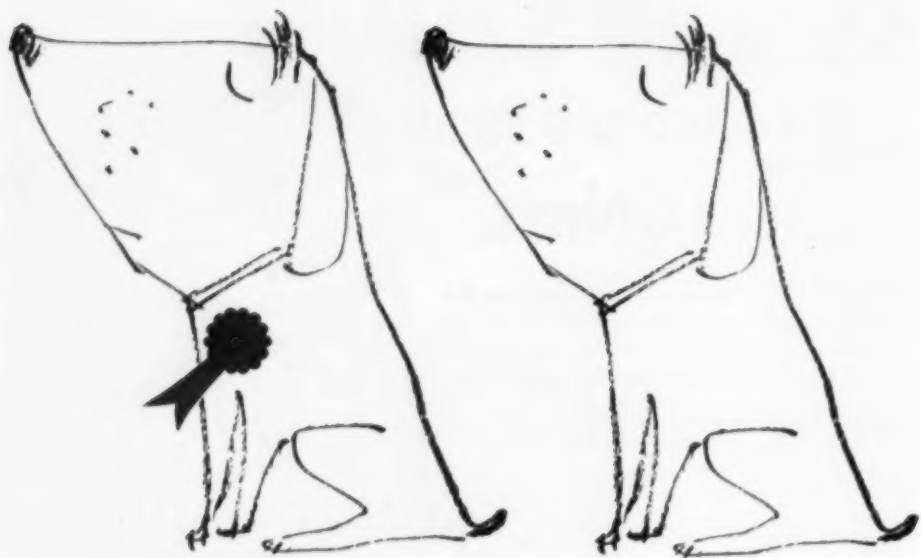
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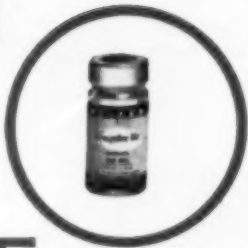
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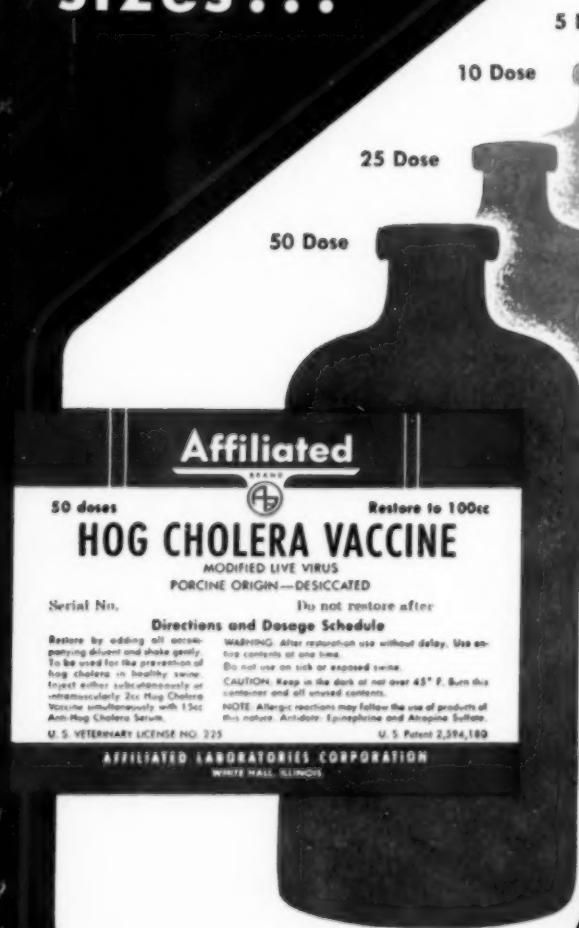
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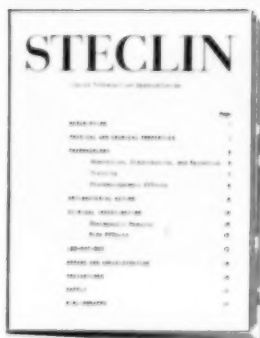
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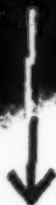
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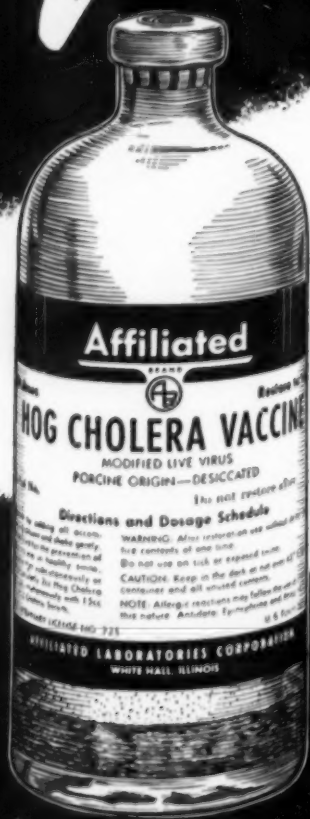


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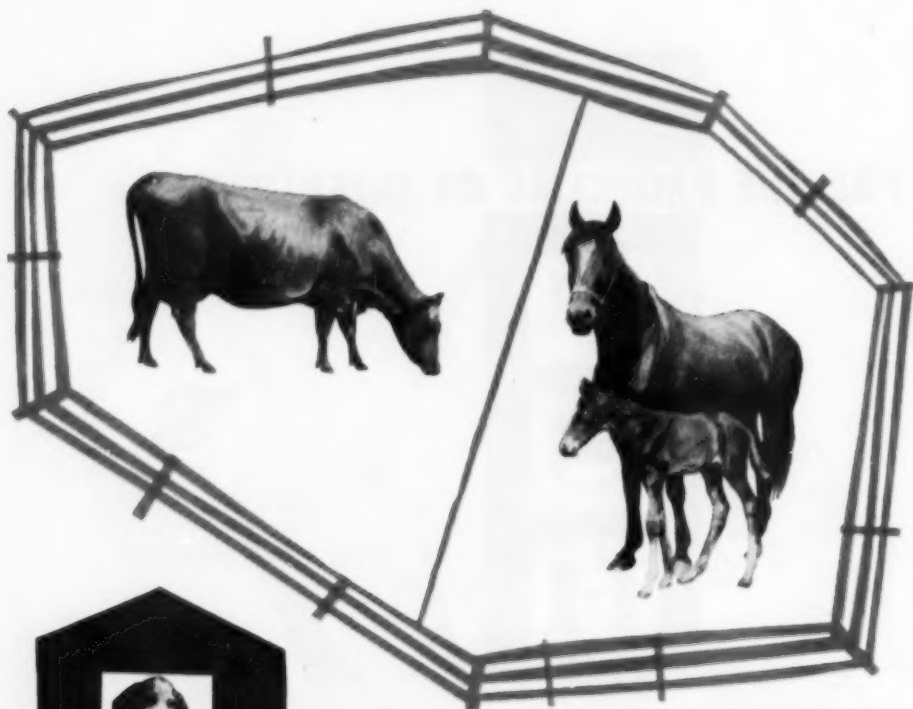
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*Rachman, M., and Frucht, T. R.: Vet. Med. 49:341, 1954.



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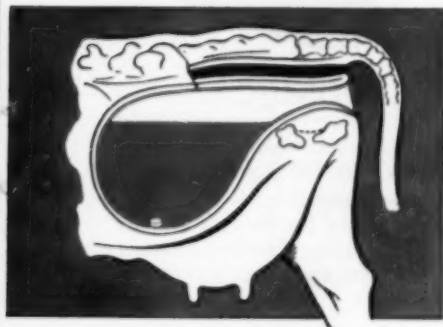
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White Muscle Disease (Myopathy) in Lambs and Calves I. Occurrence and Nature of the Disease Under Oregon Conditions

O. H. MUTH, D.V.M., M.S.

Corvallis, Oregon

WHITE MUSCLE DISEASE of lambs and beef calves has caused serious economic loss to the Oregon livestock industry for many years. It was first recognized in this state in lambs in the early 1920's and in calves in 1939. During the past fifteen years, rather extensive field investigations and some accompanying laboratory studies have resulted in findings some of which are at variance with those reported by other authors. The purpose of this paper is to report these findings and to attempt to clarify the clinical picture to some extent.

No attempt is made here to review the literature concerning white muscle disease and avitaminosis E affecting cattle and sheep, as this has been adequately done by Blaxter and Brown.¹ They have, however, apparently overlooked the work of Alstrom² who reported "polymyositis" affecting horses, cattle, and swine in Sweden. More recently Safford, Swingle, and Marsh³ have reported on experimental avitaminosis E in the calf; Blaxter⁴ has reported muscular dystrophy due to vitamin E deficiency occurring in poorly nourished Scottish beef calves; and Hartley⁵ has reported "stiff lamb disease" occurring on legume pastures in New Zealand.

From the Oregon Agricultural Experiment Station, Corvallis, Ore.

Approved for publication as technical paper #95 by the director of the Oregon Agricultural Experiment Station. Contribution of the Department of Veterinary Medicine, Oregon State College.

WHITE MUSCLE DISEASE IN OREGON

Distribution and Occurrence.—The irrigated areas of the south-central part of Oregon are most consistently affected with the disease. There is considerable difference in the extent of the trouble from year to year, and during some years other parts of the state, including the Willamette Valley, are affected. No evidence of the trouble west of the Coast Range has come to our attention. No correlation between seasonal climatic differences and the extent of the trouble has been observed.

The disease occurs throughout the year. Although it has been repeatedly observed in month-old calves whose dams had spent the previous six months on good irrigated pasture, most cases occur in the spring months since both lambs and calves are most numerous at that time.

Severity of Losses.—Losses have ranged from a few to a high percentage of young in herds, flocks, and bands. There have been instances where 50 per cent or more of the lambs in a flock or band have been affected, and losses of practically all of the calves in small herds kept on irrigated areas has been a common occurrence.

Animals Affected.—Lambs and calves in apparently good nutritional condition, from birth or earlier to several months of age, are affected. The fact that some animals are affected at the time of birth suggests that this disease may be the cause of some being stillborn. Symptoms occur most fre-

quently in lambs 3 to 4 weeks of age and in calves 4 to 6 weeks of age. The disease has occurred in Angus, Shorthorn, Hereford, Brown Swiss, Jersey, Holstein-Friesian, Zebu cattle, in cattle of mixed breeds, and in several breeds of sheep. It occurs in both lambs and calves in the same areas and at times on the same premises.

CHARACTERISTICS OF THE DISEASE

Symptoms.—Symptoms are characterized by the location and extent of the myopathic lesions. Severely affected skeletal muscles impair voluntary movement and thus, for



Fig. 1—"Chronic" white muscle disease in a 4-month-old calf.

the greater part, locomotion, resulting in muscular weakness (fig. 1), difficulty in movement, and in some individuals a relaxation of the shoulder girdle and splayed toes. There is a tendency to carry the weight of the body with the rear feet placed more forward and the forefeet more backward than normal resulting in an arched back. In prolonged cases of this nature, especially in animals unable to rise, there may be contraction of the affected muscles.

Severely affected cardiac muscles give rise to dyspnea and general weakness, frequently followed by death within a few hours after symptoms are observed. This phenomenon is commonly associated with exercise such as occurs when calves are turned out in the sunshine on a warm spring day. If dyspnea precedes death by a few hours, a bloody froth may be discharged from the nostrils at the time of death, due to the extravasation from the edematous lungs.

In lambs, signs of skeletal muscle injury have been most common. While some calves are affected in a similar manner, most of them show signs of cardiac injury.

Since this is not primarily an inflammatory disease, abnormal temperatures are not characteristic. Elevated temperatures, however, have been found in individuals with labored breathing and in some cases when exposed to direct sunlight.

Course of the Disease.—A considerable percentage of affected animals recover without apparent change in feeding or management. In some instances, especially in the case of lambs, spontaneous recoveries have occurred to such an extent as to make the evaluation of treatment difficult. In the natural course of the disease, improvement, as indicated by physical symptoms, followed by relapse sometimes occurs. Individuals showing signs of skeletal muscle injury for some time may develop signs of cardiac insufficiency and die suddenly. Calves unable to rise unassisted for as long as twenty days have been known to recover. Most cases which develop evidence of cardiac injury, as is common in calves, die within a few hours, but in some cases death occurs suddenly without appreciable symptoms.

Postmortem Lesions.—Upon necropsy, the cardiac and skeletal muscles are seen to be affected in varying degree. While both types of muscles may be affected in the same animal, this is not necessarily the case; some having severe skeletal muscle

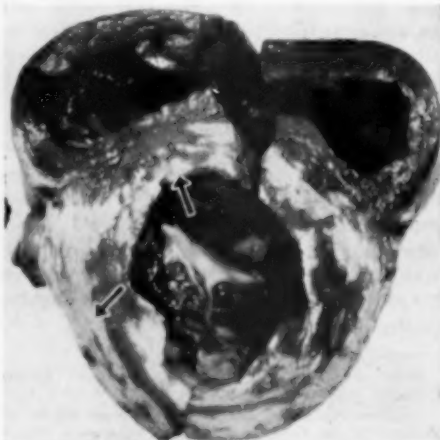


Fig. 2—Cross section through the heart of a 6-week-old calf showing severe lesions (arrows).

degeneration may have little apparent myocardial degeneration. The converse is likewise true, especially in calves where extensive myocardial degeneration occurs, the lesion most frequently occurring in the wall of the left ventricle (fig. 2).

Lesions vary from small to large discolored areas and from a slightly parboiled to a markedly bleached (fig. 3) appearance with distinct white striations. Hemorrhage and edema may be present. In the lamb's heart, lesions often appear as white sub-endocardial plaques, which may become coalesced and underlie almost the entire endocardium, giving an appearance of white enamel lining to the organ (fig. 4).

A noteworthy characteristic is that skeletal muscle lesions occur bisymmetrically in their arrangement, involving muscles or groups of muscles. In some animals, practically all of the skeletal muscles are affected.

In cases where serious cardiac impairment occurs some time before death, there is excessive peritoneal and ascitic fluid accompanied by marked congestion and edema of the lungs, and the bronchial tree may be filled with blood-tinged foam. Those unfamiliar with this disease sometimes mistake the condition for an acute severe pneumonia. Nephrosis is sometimes present but its relation, if any, to the myopathy has not been established.

Histopathology.—Others have reported histopathological studies of white muscle disease in animals several weeks of age and have attempted to interpret the sequence of the cellular reactions on the basis of what they observed in animals of that age. The animals studied were presumably selected because of their typical clinical symptoms.

The studies reported herein are of tissues obtained from calves and lambs either born dead or dying within three days of birth and originating in an area where white muscle disease is enzootic.

The tissues consisting of heart and skeletal muscle were collected as soon after death as possible, fixed in 10 per cent buffered formalin, embedded in paraffin, sectioned at 7 μ , and stained with either alcohemoxylin-eosin, silver nitrate, or alizarin red S. In some instances, the hematoxylin-eosin stain was superimposed on the silver nitrate stain.

Extensive lesions have been observed in



Fig. 3.—Section through the thigh of a severely affected calf.

hearts removed from lambs and calves at birth. These lesions appear as an acute aseptic degenerative process with some evidence of inflammation, as indicated by the presence of a slight to moderate number of macrophages. Calcification is extensive in some areas. Rows of granules are seen in some instances completely filling the sarcolemma without disturbing the architecture (fig. 5). This may occur in a considerable number of muscle fibers in a given area or in one or more fibers at intervals. Under such conditions, with appropriate staining, some of the nuclei appear pyknotic. Even in areas of extensive calcification, however, some of the nuclei appear normal.

In some areas, the cardiac lesion is characterized by apparent complete loss of sarcoplasm leaving only the supporting structures (fig. 6), i.e., a sparse matrix of connective tissue elements, remnants of the sarcolemma with what appears to be normal nuclei, a scattering of inflammatory cells,



Fig. 4—Incised heart of a 3-week-old lamb showing almost an entire white subendocardial lining (arrow).

and an apparently active capillary network. In such areas, small deposits of calcium are sometimes present, suggestive of the remnants of a more extensive, but transient, calcification.

Relation to Other Diseases.—Naturally, other diseases occur in lambs and calves affected with white muscle disease. This has apparently led to confusion by some who may not have had the opportunity to observe a great many uncomplicated cases. Symptoms resulting from pneumonia, calf diphtheria, and swine erysipelas infection in lambs might easily be confused with this disease when seen under field conditions.

FEEDING AND MANAGEMENT AS RELATED TO THE DISEASE

As previously stated, the disease occurs for the greater part in animals maintained in some irrigation districts and fed the products thereof. These irrigated farms are operated for the greater part by progressive people who use modern methods, produce excellent forage, and feed their animals well. Because of the productivity of the soil, the dry climate, and the manual control of soil moisture, growing and harvesting forage crops is done under much more ideal conditions than is true in many parts of the United States where dependence is placed on rain. Consequently the forage, which usually includes a high percentage of legumes, is much better quality than that produced in many other places. It is of interest that in some other irrigated areas of the state white muscle disease does not

appear to be a problem, yet the ecology of these areas is not apparently different from that where the disease is common.

In sheep, the disease has long been associated with the feeding of legume forage to ewes during the winter. This has also been found to be generally true in the case of cattle. However, as previously stated, some cases have occurred in fall calves from cows kept on irrigated Ladino clover pastures the previous six months.

The disease has occurred where alsike, Ladino, sweet and several native clovers, alfalfa, or vetch constituted a considerable portion of the hays with and without supplements of grain and/or molasses. It has also occurred where good "grass" silage has constituted a considerable portion of the roughage. Three instances differing from the above have been encountered. In one, 1 of 9 calves whose dams had been wintered on 2-year-old native grass hay died and at necropsy showed muscular degeneration. In two other instances, several cases occurred in calves, the dams of which had been maintained during the winter months on grass straw. These ranches belong to grass seed producers who sprayed the fields with 2, 4-D to eliminate the legumes. The grass was threshed to remove the seeds, leaving a straw with good green pigmentation.



Fig. 5—Section of heart muscle from a day-old calf showing granules of calcium salts (arrow) in muscle fibers. Van Kossa, $\times 340$.

On some ranches where a limited amount of alfalfa was produced and fed to certain groups of breeding cattle, usually heifers, the incidence of the disease in the calves from these groups compared with the incidence in other calves on the same ranch, the dams of which had been fed native grass hay, is too great to be ignored. In other instances where a part of the flock or herd was maintained on the ranch and additions were made of animals that had been run on range for a considerable part of the winter, the incidence of white muscle disease was greatest in the offspring from those maintained on the irrigated land.

The disease has not been observed in dairy calves, the dams of which were fed concentrate mixtures for high production. It has, however, been observed where dairy cows have been maintained in a manner similar to beef cattle in the area.

USE OF VITAMIN E

Vitamin E Supplement.—During the winter of 1952-1953, with the advent of an economical source of vitamin E, a trial to determine the effect of supplementary feeding of this substance was conducted. A total of 280 ewes on a ranch where the trouble was common were divided into lots I and II, with 140 ewes in each lot. The sheep in lot I were fed alfalfa hay, Ladino clover straw, and cubes containing the following mixture: oats, 875

lb.; clover seed screenings, 875 lb.; and cane molasses, 250 lb.

The ewes in lot II were fed in a similar manner except that sufficient myvamin[®] was added so that each pound of the cubes contained 300 mg. of d-alpha-tocopherol acetate. The cubes were fed at the rate of 1/2 lb. per head per day for thirty-one days prior to lambing. Actually, a few lambs were dropped between the twenty-fifth and thirtieth day on this ration. Forty days after the first lamb had been dropped, losses attributable to white muscle disease accounted for 13 lambs in lot I and 15 lambs in lot II. An outbreak of enterotoxemia in the flock, starting shortly after this time, complicated the picture. For this reason, it was deemed desirable to terminate the experiment and to include in the data only those lambs dropped up to ten days previous to the occurrence of enterotoxemia (table 1).

TABLE 1—Results of Feeding Vitamin E to Ewes

	Lambs from control ewes lot I	Lambs from supplemented ewes lot II	Total
Died	13 (11.2%)	15 (11.9%)	28
Lived	103	111	214
Total	116	126	242

In this experiment, $chi^2=0.05^†$ indicating that supplementation of the feed with 150 mg. of d-alpha-tocopherol acetate per head per day for twenty-five to thirty days before lambing had no apparent effect on the occurrence of white muscle disease.

The ewes involved in the above trial consisted of two lots that had been managed differently during the previous summer and fall. Lot A had been maintained on irrigated pastures on the ranch until the winter feeding period, and lot B had been run on a range a few miles distant, both until 104 days before lambing. In making up the lots for the feeding trials, lots A and B were divided so that an equal number occurred in the trial lots I and II (table 2).

TABLE 2—Death Rate of Lambs from Lots A and B

	Lambs from pasture ewes lot A	Lambs from range ewes lot B	Total
Died	25 (16.9%)	3 (3.2%)	28
Lived	123	91	214
Total	148	94	242

In this trial, $chi^2=10.55^†$ indicating that such a discrepancy in deaths could have occurred by chance less than one time in a hundred and that pasturing on range apparently protected the lambs against white muscle disease.

[®]The myvamin used in this experiment was furnished through the courtesy of Distillation Products Industries, Rochester 13, N. Y.

[†]Fisher, R. A.: Statistical Methods for Research Workers, 10th ed. Oliver and Boyd, London (1946): 86.



Fig. 6—Section of heart muscle from day-old calf showing normal fibers adjacent to area where there is loss of sarcoplasm (arrow). Hematoxylin-eosin stain, x 340.

Vitamin E Therapy.—The majority of affected calves, because of the frequently rapid termination of the disease in that species, do not present good subjects for therapy. In a few instances, individuals with symptoms of skeletal muscle injury have been treated with 400 to 2,500 mg. of *alpha*-tocopherol orally. The number of such cases has been too small to furnish any conclusive data as to the effect of the treatment. In no case has the result been particularly dramatic.

A considerable number of lambs have been treated orally with *alpha*-tocopherol, but the spontaneous recovery of the untreated lambs in the flocks involved has been sufficiently great to make evaluation of the treatment difficult. Operators who have treated their own lambs both orally and hypodermically with tocopherol have been disappointed in the treatment when they have maintained check animals.

DISCUSSION

In consideration of our present knowledge concerning feeding, white muscle disease as it occurs in Oregon can not be associated with poor quality feed or poor feeding practices. Livestock men have frequently associated the occurrence of white muscle disease with improved forage production, including the use of several types of fertilizers on irrigated land. Furthermore, Alstrom² reports the occurrence of polymyositis as common in extremely rainy years, and Hartley⁵ reports stiff lamb disease occurring after animals have been maintained on clover pastures. These findings suggest that modifications in forage plants resulting from rapid or rank growth may be an important factor relative to the disease, and that the leguminous plants may be the most serious offenders.

The recognition of lesions in the young at birth raises a question concerning the time of occurrence of the initial lesions in animals that develop symptoms at several weeks of age. Since it has been impossible to perform necropsies on a considerable number of apparently healthy animals at birth on the affected ranches, this question has not been answered. Perhaps initial lesions are common at birth and symptoms develop later when increased function, due to growth and exercise, is demanded of the affected organs.

The results of the feeding trial with sheep indicate that the kind of feed consumed during the early gestation period may be particularly important. The occurrence of the disease on cattle ranches where the herd is separated during the grazing

period also suggests that nutrition during the early gestation period might be critical in so far as cattle are concerned.

Neither discoloration of fat nor tetany as reported by Blaxter *et al.*,⁶ occurring in calves fed on a vitamin E-deficient ration, has been observed in naturally occurring cases of white muscle disease. Another point of difference, as pointed out by MacDonald *et al.*,⁷ is the absence of severe calcification in their experimental calves as compared with naturally occurring cases in this region. Blaxter⁴ states that the disease as it occurs in Scotland "is closely associated with the poor quality of the ration" consisting of swedes (rutabagas), mangolds, fodder beets, and oat straw. Such rations are far different from those fed in the irrigated sections of this state (Oregon), as previously mentioned. When the type of feed involved in Oregon is considered in the light of Brown's⁸ assay of feeds for vitamin E, one would be inclined to consider seriously Hartley's⁵ supposition that "it would be difficult to postulate an uncomplicated vitamin E deficiency" as being the cause of this myopathy. Biochemical investigations which should enlighten this problem are now in progress at this station.

SUMMARY

White muscle disease as it occurs in Oregon lambs and calves is discussed. The disease has been recognized in lambs and calves at birth as well as in older animals and constitutes a serious economic problem in some fertile irrigated areas. The disease occurs under conditions that, in the light of present knowledge, must be considered good feeding and management.

A trial with ewes in which the ration for thirty days prior to lambing was fortified with 150 mg. of *alpha*-tocopherol acetate per head per day is reported. This supplementation with *alpha*-tocopherol failed to prevent the disease.

Evidence is presented that nutrition during the early part of gestation may have a bearing on the disease.

The results of vitamin E therapy on affected animals are inconclusive.

References

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Swine Erysipelas Found at Meat Inspection

When 15,894 pigs were slaughtered in an emergency in Germany and were then examined bacteriologically, *Erysipelothrix rhusiopathiae* was cultured from 4,139. Positive cultures were recovered in two or more organs from the majority of pigs, but in 336 pigs positive cultures were recovered from the kidneys only, in 280 from the spleen only, in 84 from the liver only, in 20 from the lymph nodes only, and in 16 from the musculature only.—*Vet. Bull., Dec., 1954.*

Mexican Cattle Imports.—In the first three weeks after the opening of the border on Jan. 1, 1955, 73,000 cattle were imported into the United States. The quota for the year is the equivalent of 346,000 head in live cattle or beef, with a limit of one-half of this amount to enter each half year.—*The Cattleman, Feb., 1955.*

Rabies Immunization in Austria

When 29,558 dogs were vaccinated in Austria in 1950 with a phenol-glycerol vaccine, 7 developed paralysis and 12 later developed confirmed rabies. When 28,868 dogs were vaccinated in 1951, paralysis developed in 0.18 per cent of those given the above vaccine, in 0.35 per cent of those given adsorbate vaccine prepared from dog brain, and in 3.6 per cent of the 12,438 given adsorbate vaccine prepared from horse brain.—*Vet. Bull., Jan., 1955.*

How to Obtain Permission for Animal Hospital in Zoned Area

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Setting up a new location for a small animal practice today presents many more and different problems than it did a few years ago when only the larger cities had zoning laws and when the areas immediately outside these cities had no zoning restrictions. A veterinarian could, at that time, build almost where and as he wished without fear of any one interfering with the construction or operation of the hospital. Even in the cities, the zoning ordinances which existed were fairly loose. If a veterinarian conducted an ethical practice without disturbing the peace, he soon was established as a "squatter" with the privilege of practicing indefinitely without interference. Now, zoning in cities and townships alike has become more strict.

The postwar trend of moving from cities to build nice homes in the immediate suburban areas also brought a desire to protect this real estate with zoning laws. Many state legislatures passed laws allowing cities to control zoning within a several-mile radius. Where this was not done, the township was given zoning rights. With these laws came zoning boards and, unfortunately for veterinarians, not all board members nor property owners like pets. As a result, those interested in building an animal hospital often find few desirable locations available.

Zoning usually has three general categories: residential, business, and commercial, with each being further subdivided. The residential categories range from large estates to multiple dwellings. Businesses are also classified in four to six categories, depending again on the community. A veterinary hospital usually is given the lowest business or the highest commercial zone rating. A new development, particularly a suburban one, is zoned as residential which means that a hospital or business, to obtain a variance, must present its case before a zoning board. Most of the board members are community-minded citizens serving without pay, who are interested only in preserving the residential rating of the

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community and in protecting their property values. Before a variance case is heard, the proposal to rezone must be published for a minimum of two weeks in an official notice in the community newspaper. Also, every property owner within a given radius of the proposed variance must be sent a registered letter telling of the intent of the proposal. Any person with objections may then get several property owners either to appear before the board or to sign affidavits to block the proposed veterinary hospital or whatever the variance may be. Occasionally an attorney is retained to present their objections.

The above briefly indicates the situation which existed when I decided to locate in Indianapolis. To overcome the objections involved much work, but a permit to build a hospital was finally secured. On reviewing the method used, it seems that it should also work elsewhere because probably no board could be more obstinate than was this one.

At that time, Indianapolis seemed to be a most desirable location since the area contained about 14 per cent of Indiana's population and less than 4 per cent of the state's practicing veterinarians. After checking the existing veterinary locations, a desirable spot for another veterinary hospital was selected. Upon appealing to the zoning board, I was informed that the area could not be zoned for a veterinary hospital and that 13 such requests in the county had been refused. The board was not even considerate.

A well-established realtor with a good reputation then was found and presented with the problem and the desired location. He believed that if the matter were properly handled, the zoning could be secured. First, he located a piece of property already zoned for a business with a class 2 rating, but a veterinary hospital required a class 6 or 6B rating, the lowest of the business category and just above the rating of commercial zoning. This property was bought, subject to zoning approval. The realtor then advised that an attorney experienced in zoning board operations be employed. One was employed on a "double or nothing" basis. This may not always be advisable but it worked.

The attorney obtained several photographs of good-looking veterinary hospitals

with affidavits of their immediate neighbors stating that they had no objections to these hospitals. Two affidavits actually stated that the hospital was a neighborhood asset. He then had us contact all of the property owners within a third of a mile of the proposed site telling them just what we had in mind and why it would not harm them or their property. Thus, all of the persons who had been served with registered notices of the zoning variance meeting were again contacted. This produced such a favorable reaction that at the time of the meeting one aged couple actually offered to help in obtaining the variance.

Pictures were taken of the location and artists' sketches made to show how the premises would look when in operation. The attorney, knowing the sentiments of the board members, had us emphasize the advantages of such things as ample parking and good landscaping. One member disliked large billboards and since one was on the premises the fact that it would be removed was stressed.

In summary, to secure a desired location for a small animal hospital in a zoned area: Decide on the general location, consult an able local realtor, buy the desired site, employ a good attorney who will work closely with the realtor, personally contact all prospective neighbors prior to the zoning meeting, and let the attorney present your case to the zoning board.

Foot-and-Mouth Disease in England

The first outbreak of foot-and-mouth disease in Britain since April, 1954, occurred Jan. 22, 1955, among hogs and cattle and spread to four neighboring farms in nine days. All diseased and contact stock were immediately slaughtered. Since there was no further spreading of the disease, restrictions on movement of stock were withdrawn February 22. The infection was believed to have come from meat scraps of foreign origin which were fed to the swine.—*Off. Internat. des Epizoot.*, March 3, 1955.

Foot-and mouth disease was diagnosed in cattle in the province of Transvaal, Union of South Africa, on Dec. 17, 1954. The last previous outbreak in the country was in 1951.—*Off. Internat. des Epizoot.* Jan. 26, 1955.

Urbain Leblanc—Early Veterinary Pioneer in Cancer Research

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IN THE AUGUST issue of the *Recueil de Médecine Vétérinaire* of 1858, an article appeared entitled "Recherches sur le cancer des animaux." Its author, Urbain Leblanc, a name known to only a few today, enjoyed considerable prestige and acclaim in the last century. One of the outstanding graduates of Alfort, one of the oldest veterinary schools in the world, Leblanc completed his studies there in the early part of the nineteenth century and immediately embarked on a career that was to win him fame both in practice and research. Even in his own day he was credited with a foresight and vision far in advance of his time.

In his various works and articles one can sense a restless spirit seeking to probe the mysteries that still await discovery by an alert scientific mind. Of particular interest to the student of the history of veterinary medicine is the article cited above, wherein he prefaced his remarks on research in animal cancer with a brief historical sketch of the literature on the subject up to 1844.

Having found no definition of cancer in the ancient and medieval treatises on animal diseases, he quoted Ruelle as the first veterinarian to define cancer in modern times. In 1530, the latter gave a definition in Latin which described vaguely some of its general symptoms.

Not until he perused a work written in 1755 did Leblanc discover any expression of opinion on the subject. The writer in question was Garsault, who, despite his brief analysis, made specific reference to equine cancer. The description of Garsault, as Leblanc noted, had more relevance to external cancer in man and indicated the former's ignorance of the existence of cancer in its more serious and internal form.

Ten years later, a Dr. Lafosse devoted several pages in his "Dictionnaire d'hippiatrique" to cancer. Leblanc, while crediting him with more than average insight for his period, nevertheless found only a study of

superficial symptoms of the disease and took him to task for designating as cancer thick indurated areas, cold deep abscesses, and swelling of the sublingual lymph glands of the horse affected with chronic glanders, and for recommending only partial excision of cancerous tissue when topical medication failed.

In his study of subsequent literature Leblanc, although amused by the hypothesis of Camper, who in 1783 concluded that animals were apparently not subject to cancer, still considered it significant that he based his theory largely on the fact that the life span of animals was shorter than that of man. At this point, Leblanc reflected that dogs, in living the longest in view of their average period of existence, are more often found to be affected with cancer.

Continuing his historical review, Leblanc presented a few sources which described various conditions that bore only a superficial resemblance to cancer. After having expressed his impatience frequently concerning the constant confusion of a simple swelling with a true tumor, one can detect a note of relief when he pointed to an article of 1813 in the memoirs of Dr. Gohier; the treatise in question contained a brief, but accurate account of equine cancer that arose in the testicle and the pelvic and sublumbar regions.

When he proceeded to consider the status of cancer since 1821, Leblanc treated a period that was of greater meaning to him, inasmuch as he was a part of it. Hurtrel d'Arboval, one of his contemporaries, in 1826, analyzed cancer on the basis of comparative medicine by drawing several analogies between various phases of the disease in man and their counterparts in animals. Leblanc had particular praise for his colleague's account which he views as one of the first accurate descriptions of cancerous tissue in animals.

While praising the definition of cancer as given by d'Arboval, Leblanc nevertheless rejected his opinion that excision of a malignant tumor should be delayed until the final stages, as well as that of Vatel

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who, in 1828, recommended surgical removal only after antiphlogistic medication had failed.

With some pride, Leblanc next referred to the research that Dr. Trouseau and he began in 1827. In making numerous necropsies, they recorded what were probably among the first descriptions of internal cancerous lesions in animals. As for the etiology of cancer, the two investigators agreed that unless a type of chronic inflammatory change had existed before the formation of cancer, it would not be possible to determine its origin. They advanced the hypothesis that cancer was traceable to a general blood infection. Later they recognized that different types of homologous tumors could develop and that mixed tumors could form. They observed that cancer could occur in soft pulplike areas as well as in indurated tissues.

Of considerable interest is an enumeration by Leblanc of the cases of animal cancer reported in learned journals from 1826 to 1843. In that period, 60 cases were recorded by 52 veterinarians in both French and foreign publications as observed in the horse, mule, donkey, cow, dog, and pig. After analyzing these statistics, Leblanc listed the following organs according to the frequency of their involvement with cancer: mammary glands; lymph nodes, in particular those of the inguinal region, axillae and mesentery; uterus; vagina; stomach; intestines; skin; testes; ovaries; lungs; liver; kidneys; bladder; penis; prostate; spleen; heart; eyes; tongue; and bones. With characteristic caution, he warned against any premature conclusions because of the limited data at hand.

In 1843, he published a note on canine and feline cancer in which he asserted that in his years of study he found the dog and cat much more susceptible to cancer than the herbivores. He perceived further frequent coincidence between softening and ulceration of tumors and a recurrence with rapid propagation and cancerous cachexia, and noticed that often cancerous tumors, although firm at first, later became softer and were reduced to a sort of putrescent or even liquid mass. Hence, he concluded that complete and immediate ablation of such tumors was imperative.

In a subsequent article in the September issue of the *Recueil de Science Vétérinaire* of 1858, Leblanc outlined the new phases of

his study undertaken from 1843 to 1852. Opening with a reference to the role that the microscope will play in future veterinary research, he recalled how he had championed from the first the use of this instrument in furthering knowledge in his particular field as well as that of medicine in general. Leblanc displayed his foresight by stressing the importance of the comparative study of diseases common to both man and animal.

Summarizing the results of a microscopic comparison of cancerous tissue in man and animals, he pointed to the heteromorphous cell as the one proper to the lesion called cancer. The function of the veterinarian in cancer research assumed considerable importance in his mind, in the light of the relative ease with which tumors can be examined in animals. Listing the principal forms of cancer recognized at that time, he disclosed the microscopic characteristics of the cancer cells.

Leblanc considered such particular aspects of tumors as their origin, occurrence, and frequency in various species. In the equine species, he discovered true cancer to be rare. Although aware of numerous reports of equine tumors, Leblanc minimized their significance because he was aware that many of these cases had merely consisted of indurated tissue. He reminded the reader that cancer displaces or atrophies the normal tissue, causing death by injuring one or more vital organs and not by general infection.

In his study of porcine cancer, he found no evidence of an inhibiting effect of cancer or tuberculosis on each other, a view which was prevalent at the time. He noticed that although cancer is rare in cattle, its seat is usually in the pylorus and the lymph glands, whereas in the canine and feline species, the mammary glands are the most common site of tumor involvement.

Leblanc affirmed his belief that animal cancer is essentially the same as that in the human organism, despite conflicting views among many of his colleagues. The swellings occurring in the jaw bones of horses and cattle he declared for the most part noncancerous, for no generalization of the condition or change in the general health of the animal had been perceived; moreover, ablation invariably resulted in a radical recovery. He also

observed firm tissues with fibrous elements mixed with pus emerging in the lesions of the same animal.

At the end of a lengthy enumeration of conditions commonly mistaken for cancer, Leblanc remarked that one purpose of his study was to eliminate existing confusion in diagnoses. Alluding to his unsuccessful attempts to transplant cancer from man to horses and dogs, he mentioned similar efforts at transplantation between the latter two species.

Having noticed that carnivores are more susceptible to cancer, he prescribed a vegetable diet for these animals. When removal of the tumor is necessary, he advocated surgery as opposed to cauterization.

In the resumé of his review of cancer research in animals, Leblanc regretted the neglect of this field by veterinarians prior to 1821. The microscope is hailed as an invaluable instrument in furthering knowledge of the subject. In true cancer of animals, which is basically similar to that of man, rapid propagation is found, with tumors occurring in all regions of the body and, in the opinion of Leblanc, probably not amenable to treatment as it usually recurs after excision. He reiterated that even its failure to reappear after excision is no assurance that the patient is completely recovered as there may be hidden foci of cancer.

In attempting to determine its etiology, Leblanc established some general conclusions, namely: greater susceptibility in the female; its greater frequency in carnivores as compared with herbivores; the possibility of a hereditary factor, at least in dogs; the confusion of simple swellings with true cancer; the importance of immediate excision of the cancerous tissue as the most advisable procedure.

Almost a century has elapsed since Leblanc made his analysis of veterinary research on cancer. Understandably some of his remarks are naive and his conclusions unfounded in the light of present knowledge. Nevertheless, his observations concerning the nature of cancer as opposed to noncancerous lesions, his means of therapy, prognosis, approach to statistical analysis, and attempts at transplantation were unique in the field of animal cancer research at that time.

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Bushman's Death Due to Deficiency?

The death of Bushman, the 22-year-old, 550-lb. gorilla at the Lincoln Park Zoo, Chicago, on Jan. 1, 1951, after a seven-month illness, led to an exhaustive study of his case chiefly by pathologists and neurologists at the University of Chicago. Apparently, the immediate cause of death was passive congestion, especially of the lungs, and cardiac insufficiency.

Like several other captive gorillas, only 1 of which has lived longer (3 years) than Bushman, he had developed a paresis which in his case affected the legs and one arm. However, a suspected senility factor was ruled out by the findings which indicated a nutritional disorder suggestive of beriberi and possibly a deficiency of vitamin E as well as of the B group. Also lead poisoning could not be excluded as a possible factor. There were marked retrogressive lesions in the nervous and muscular systems, heart, blood vessels, testes, liver, and spleen. He was infertile but no male gorilla has been known to become sexually mature in captivity.

Gorillas, only a few thousand of which remain, have sharply restricted habitats in two hot, wet areas in equatorial Africa; therefore, some special nutritional elements may be inadequate elsewhere. If properly nourished, captive gorillas probably would live much longer.—*Archiv. Path.*, Jan., 1955.

Bushman's successor, Irvin Young, at 10 years of age is estimated to weigh 275 lb. At latest comparable weights, he was larger than Bushman. He daily is fed approximately 6 potatoes, 4 yams, 3 or 4 heads of lettuce, 2 stalks of celery, 1 lb. of green beans, 3 or 4 carrots, 3 lb. of grapes, 9 to 12 apples, an orange, a loaf of whole wheat bread, a quart of milk, and vitamins. He would eat more.

Kennel Construction and Management in Relation to Longevity Studies in the Dog

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THIS REPORT deals with kennel ground planning, construction, and procedures as evaluated from the standpoint of the animals' well-being. For the past three years, the School of Veterinary Medicine at the University of California has been engaged in establishing a kennel for longevity studies with a large number of dogs.^{*} Although many acceptable kennel designs exist, dimensional and operative data in relation to epizootiology and animal behavior are scant or lacking. The data presented in this report give promise of wide application wherever dog kennels are to be maintained for research or commercial purposes.

This experiment is primarily concerned with the life span of the normal dog as compared with that of animals receiving varying doses of total body x-irradiation as discussed by Blair.¹ The animal's longevity, the period of existence between birth and death, depends upon genetic background, care, and environment. From these factors are derived the principles of basic animal husbandry which take into consideration inheritance, nutrition, exercise, protection from the weather, contentment, and the control of disease and parasites.

Aside from accidents, including disease in the broad sense of the term, the life span of an animal is dependent upon its gene complex. This determines the progress of factors causing the various body structures to age. Therefore, efforts have been made, in establishing this kennel, to insure a healthy genetic background and to provide conditions that minimize accidents. Lansing² states, "The fact is that we know very little about aging." The causes of death in man as listed by the Metropolitan Life Insurance Company³ are many, but purely old-age phenomena have not been definitely determined. Little as is known about aging in man, even less comparable data are available for animal life, including the dog, and yet all species have old-

age characteristics if accidents can be prevented long enough for them to become manifest. This study was established to provide a basis for comparing the variations developing from the effect of total body x-irradiation.

Large numbers of dogs are needed to obtain a valid explanation of the causes of death. An aggregation of animals, however, favors an increase in morbidity and mortality due to infectious disease. Thus, in this kennel, every effort has been made to provide optimum conditions for normal life in a number of dogs.

ASSEMBLING THE EXPERIMENTAL ANIMALS

The Beagle breed was selected as the experimental animal because of the dogs' moderate size and weight, medium length of hair in two or more colors, and even disposition, and also because they are adapted to packs and do not require cosmetic surgery, although their penetrating bark and wandering tendency are objectionable.

This experiment required a minimum of 350 dogs. Females were preferred, to make possible the accumulation of measurable reproductive data. Also, the female has less aggressive tendencies than the male, and excretes urine directly on the ground. To obtain this number of females, a breeding colony was started in June, 1951, and completed in April, 1952. Eighty purebred females and 7 males were obtained from kennels and individual dog owners. In these animals were represented the variations within the standards of the Beagle breed.⁴ In addition, 5 nonpedigreed Beagle-type females were obtained to lessen the possibility of breed sensitivity. This group of animals was held in isolation for one month, during which time 15 females and 1 male were culled because of undesirable characteristics. The remaining animals, constituting the breeding colony, were placed on the kennel site. The progeny from this colony supplied the experimental dogs.

THE EXPERIMENTAL KENNEL

An area 250 ft. by 450 ft., located about 1,000 ft. from the veterinary school buildings, was selected as the kennel site. It had previously been leveled for irrigation and consisted of heavy adobe soil. In this region, the annual temperature extremes vary from 20 F. to 110 F., with a high relative humidity in the winter and a low relative humidity in the summer.

Developing a ground plan for this kennel re-

^{*}From the School of Veterinary Medicine, University of California, Davis.

^{*}Atomic Energy Commission, project 4, contract AT-11-1 Gen. 10, "The Effect of Radiation on Work Capacity and Longevity of the Dog."

quired several preliminary determinations: the desirable number of dogs to be placed together; the size, shape, and arrangement of pens; and the height and construction of the restraining fence. Satisfactory information was obtained after six months of experimentation.

It was found that the optimum number of dogs for each pen was 2, preferably unrelated animals. A dog placed alone in a pen often developed undesirable traits, such as pacing, digging, or jumping. When pacing, the animal constantly trotted back and forth over a given path in an obsessive manner. Such an animal consumed more food and remained in a thin but muscular condition. Paired dogs in neighboring pens then acquired the habit, and it appeared this activity could spread throughout the entire kennel. Placing more than 2 animals in a larger pen resulted in frequent quarreling and occasional serious fighting. When 8 females were placed in one large pen (25 ft. by 35 ft.), 1 of them soon became the leader. A fight started by the leader would draw in the other members of the group and end in the victim's death. Three deaths occurred in this manner in five months.

Several sizes, shapes, and arrangements of pens were tried. Paired animals covered more pen surface in their daily activity when allowed a minimum of 10 sq. ft. of ground per inch of body height. A rectangular pen of 1:2 proportions was found to be preferable. Smaller or differently shaped pens resulted in an uneven surface coverage and also led to digging or jumping. When the

pens were close together, there was less tendency for the animals to attempt escape.

A ground plan, therefore, was designed as shown in figure 1. This plan included a 6-ft. cyclone fence surrounding the kennel site, with one entrance at the southeast corner and another on the west side. This enclosed area was covered with 8 to 9 in. of creek-run gravel to establish drainage. Elevating the original ground level with gravel has proved satisfactory in preventing standing water during heavy precipitation.

The two quonset huts located between the breeding and experimental pens (fig. 2) provide space for storage of feed and equipment, a field laboratory, office, and living quarters for a night attendant. The 168 experimental pens are arranged in 14 units of 12 pens each. Each unit has a 4-ft. concrete center pathway with pen gates opening into the pathway at the adjacent corners of the pens.

CONSTRUCTION AND EQUIPMENT OF PENS

Each experimental pen (13 ft. by 29 ft.) provides 377 sq. ft. of surface area. The 5-ft., cyclone-type fence enclosing these pens is held in position by galvanized posts, with a top rail and spring steel wire at the base. Below the fence, a 6-in. by 10-in. concrete curb extends 2 to 3 in. below the ground level.

An underground water line supplies each pen with running water from a hose bib

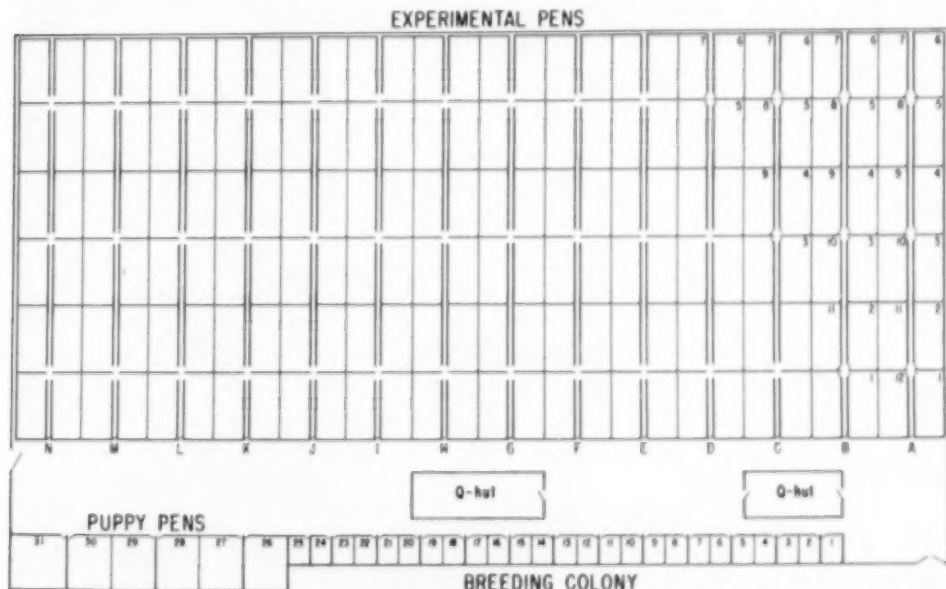


Fig. 1.—Ground plan showing the arrangement of experimental pens, two quonset huts, breeding colony, and puppy runs.

placed high enough above the ground to allow a 6-qt. pail to swing freely. Each dog is provided with an aluminum pie pan for feeding. An economical housing unit was constructed by slightly modifying the barrel design presented in the "Modern Dog Encyclopedia."² Two used wine or beer, oak barrels (capacity 20 to 30 gal.), raised off the ground by a redwood stand (fig. 3), provide each dog with its own barrel, since few animals share their sleeping quarters. The barrels have their closed ends facing the southerly rains and the open north ends protected by redwood boards placed 6 to 8 in. in front of the barrels with a vertical partition between the two entrances. This front supports a 3-ft. wooden platform covering the barrels for added weather protection.

Aluminum tinting of the platforms and sides of the barrels lowers the temperature in the barrels several degrees. On one warm day, a thermometer registered 97 F. under a nearby tree, 94 F. under a nontinted platform, and 92 F. under a tinted platform. This type of doghouse apparently affords ample protection, as heat exhaus-

tion has not been observed in this kennel. Preservative treatment consists of coating the outside of the barrels with asbestos roofing tar and spraying the inside with raw linseed oil diluted with paint thinner (1:10).

Bedding material was not found to be necessary, since several types (sawdust, rags, paper, etc.), when placed in the barrels, were removed by the dogs within a few hours. The common bed sore has not been observed with this type of a housing unit.

HANDLING PUPPIES RAISED IN THE PROJECT

Puppies are weaned at 5 weeks of age. This is facilitated by feeding meat broth for three to four days before and after separating the litter from the dam. Each pup is then tattooed in the right ear with its litter number and receives avianized distemper and infectious canine hepatitis vaccines.[†] The males are placed in the puppy runs (fig. 1), and the females are paired as nonlitter mates in the experimental pens. A second injection of infectious canine hepatitis vaccine is given when the puppies are between 7 and 8 weeks old. At 6 months of age, the pen number is tattooed in the

[†]Supplied by Lederle Laboratories Division, American Cyanamid Co., Pearl River, N.Y.



Fig. 2—Aerial view of kennel. The large barracks-like area contains the experimental dog pens.

left ear and also on the left flank, and photographs, showing the date and the dog's number, are taken as a further means of identification. The experimental dogs remain throughout their life span in the assigned pen, except for necessary experimental procedures.

NUTRITIONAL REGIMEN

The diet consists of raw beef and compounded ration. Once or twice weekly, each animal receives between $\frac{3}{4}$ to 1 lb. of fresh frozen beef obtained directly from a local abattoir and consisting of cheeks, hearts, and oxtails. Oxtail, besides being a food, is excellent for de-tartaring and keeping the teeth and gums in good condition. The ration fed for the remainder of the week is compounded from foodstuffs selected as to price, availability, et cetera, according to methods used in the general feeding of farm animals. The following ration has been fed for the past thirty months:

Meat scraps, beef source	46.0%
Bread crumbs, bakery source	40.0%
Fish meal	8.0%
Alfalfa meal	1.5%
Blood meal	1.5%
Liver meal	1.0%
Dehydrated milk	1.0%

Salt	0.5%
Vitamins	0.5%

A—500,000 U.S.P. units per 100 lb. of microtized crystals;

B complex — 50 mg. each per 100 lb. of riboflavin, pantothenic acid, and niacin;

D — 5,000 U.S.P. units per 100 lb., irradiated yeast source.

These ingredients are mixed biweekly and stored in large covered containers. The mixture is prepared for feeding by adding warm water in a concrete mixer until the desired consistency is obtained. It is then emptied into a clean wheelbarrow and distributed to the dogs, each animal consuming approximately $\frac{2}{3}$ lb. once daily.

A small quantity of fresh green feed is given to each animal every three to five weeks. Some dogs relish lush monocotyledonous plants; however, this material does not appear to be essential to the diet. The dogs preferred barley grass to wheat or oat grass.

The diet must be complete. The criteria which assure this include its palatability and the occurrence of regular estrus, gestation, lactation, growth, fecal consistency, and general appearance of well-being. Over 150 litters have been raised on this ration without cases of eclampsia; neither has



Fig. 3—A unit of 12 pens with a center pathway. This arrangement allows sociable meetings between neighboring dogs. Used oak barrels, raised off the ground and covered by boards, make an effective and economical doghouse. The 5-ft. fencing is without restraining barbed wire.

there been any difficulty in regard to palatability or the animals' general well-being.

GENERAL KENNEL MANAGEMENT

The daily routine begins with feeding. One caretaker feeds approximately 125 dogs in individual feed pans in one hour. After feeding, the caretaker enters each pen, observes the animals, refills the water pail, removes the feces, and places the feed pans on the fence. Four units (96 dogs) are cleaned daily by each caretaker.

Each man works three, eight-hour days and three, five-hour days, then has three days off. The afternoons are used to tidy each pen, clean the feed pans and water buckets with soap and water, and wash the concrete pathways. One caretaker is required for every 52 dogs. This includes the foreman who also tabulates all observations in a daily record book.

The caretakers spend approximately two and a half minutes in each pen daily. This human relationship appears to be welcomed by the dogs and influences their manner during examination. However, to avoid having the caretakers favor certain animals while perhaps rejecting others, the men rotate one unit of dogs monthly.

Regular bimonthly veterinary examinations are made by bringing an examination table (fig. 4) to the pens. The body weight, rectal temperature, stage of estrous cycle, general condition (including hair, teeth, eyes, and ears), and other desired clinical data are obtained from each dog. This record and the daily information are tabulated in a separate file for each dog.

PSYCHOLOGICAL REACTIONS OF THE ANIMALS

The tranquility of experimental animals throughout a life span in confined quarters is particularly important. Dogs definitely manifest social characteristics as shown by their manner of play, exercise, rest, and companionship.

The gregarious habits of this species are particularly noticeable when the animals in four adjoining pens get together. These social meetings vary between groups of animals but have a definite daily pattern. Some, after eating, form into a group for a period of time, then separate and exercise by playing with their pen mates. Certain individuals pay little or no attention to other animals, preferring to stay by themselves. The wire fence allows close animal contact but makes harmless any



Fig. 4—The examination table brought to the pens for regular bimonthly veterinary examination of each dog.

interpen arguments. This arrangement adds to the contentment of the experimental animals and makes a restraining barbed wire above the fence unnecessary. Approximately 400 dogs have been raised and kept within a 5-ft. fence and none has jumped the enclosure. Animals removed from their permanent quarters appear lost and show a desire to return to their respective pens. Digging into adjacent pens is not a problem.

The ground surface is also related to the animals' contentment. A gravel surface has the advantages of being movable, not becoming excessively hot or cold with weather changes, and allowing moisture to penetrate. Objections to this surface include the manual labor required to keep the pens tidy and the ingestion of gravel by the dogs. While it has not been a cause of death, gravel has been observed in the stools of a large number of dogs when blood meal or liver, or both, were excluded from the diet.

The additional surfacing of packed gravel with 2 to 3 in. of $\frac{1}{4}$ -in. crushed rock has been found to be the most satisfactory surface. The platform above the barrels also contributes to the dogs' contentment, serving both as an observation post and a vantage point for teasing their mates in play.

Females in estrus show a definite change in disposition; a sociable individual often isolates herself from members of the group while tenseness may be observed in otherwise phlegmatic individuals. The female in mid- or late estrus may attract her mate for the purpose of riding in a sexual manner. Nymphomania has not been observed to create an adverse relationship between paired females. All of these sexual and individual characteristics may be modified by providing adequate housing quarters and a pen of appropriate size.

A healthy animal in an enclosure is alert to outside activity, demonstrating its reactions by running, barking, quarreling, or other psychological manifestations. Outbursts of this kind may become annoying habits requiring control measures, in some cases drastic ones. In this kennel, surgery was necessary to control barking after other methods proved only temporary. Removal in large part of the vocal cords has both a physical and psychological effect. Following the operation, the animal con-

tinues barking, but the volume is decreased to a mellowed utterance and eventually the animal barks less often. Although the volume of the bark does increase somewhat a few weeks after the operation, it has usually been effective in modifying this habit.

Social traits should be considered in kenneling. This study shows that kennel design and management can influence the daily activities of the dog, including keeping it free from depression and preventing loss of appetite.

EPIZOOTIOLOGY

This kennel offers a means for evaluating the effect of design, construction, and management upon the spread of parasites and diseases. The problem of disease control may be approached in two ways—either by the complete elimination of disease which, if possible in a larger number of dogs, would result in a high degree of disease susceptibility, or by fostering a low incidence of disease which would bring a certain degree of immunity. The latter alternative was selected in this kennel, as it more closely approaches natural conditions.

The epizootiology of infectious disease has been observed in this kennel both from trial challenges and natural invasions. Such evidences of disease as coryza, kennel cough, and pneumonia, when brought into the kennel by infected animals, resulted in a similar pattern of spread. When an animal was challenged by exposure, infection developed and an irregular and diminishing spread occurred. In each case, the disease gradually disappeared instead of increasing as might have been expected. In many trial challenges with dogs exhibiting the clinical signs of the distemper complex, no spread was evidenced by clinical manifestations, except for one instance. Following an exposure of 2 animals to an animal affected with distemper, which later exhibited "hard pad," the disease continued in the kennel for a three-month period, yet it affected only 15 of the 400 dogs (3.8%). The pattern of spread was similar to that described for the respiratory disease. Eleven of the 15 cases proved fatal, a mortality of 2.8 per cent from this virulent disease.

A general seeding of the parasites which infected the dogs took place during the

assembling and establishment of the kennel. The foundation breeding stock and purchased experimental animals were isolated for a short period before being admitted into the kennel but, in spite of this preliminary examination and treatment, they again showed evidence of parasites after being placed on the kennel site.

Repeated fecal flotation examinations have been made on these animals and their progeny during the past three years. Those animals showing evidence of parasites have been treated with a recognized therapy for the identified parasite. Probably no species of parasite originally introduced into the kennel has been eliminated, but the number of stools indicating the presence of parasites has progressively decreased to a low level, and the spread of parasites between pens has been reduced to a minimum.

How the movement of gravel between pens contributed to the spread of parasites was demonstrated by placing aluminum-tinted gravel in one pen and observing its movements as it was displaced by the dogs and caretakers. After some weeks, the marked gravel spread over several pens and even into neighboring units of pens. To restrict this movement, the coarse gravel was raked into a mound toward the center of the pens, the finer gravel remaining toward the outside of the pen. This facilitates the removal of feces, as most dogs defecate away from the housing unit in the center of the pen. The daily collection of feces, by shovel, includes some soiled gravel, about $\frac{1}{2}$ cu. yd. of gravel being removed from the kennel weekly. This removal of gravel which has been soiled by feces and urine prevents excessive odors from accumulating, reduces the attraction for flying insects, and creates a more desirable working atmosphere.

Skin disorders and ectoparasites have not been a problem. All purchased animals were dipped in a 1 per cent solution of chlordan upon arrival and again after one week. Since then, fleas have not been observed. One infestation with lice in a few animals also was eliminated by dipping each dog twice at a weekly interval in a 1 per cent chlordan solution. Although several purchased animals exhibited skin lesions, including 3 which exhibited a dermatitis diagnosed as demodectic mange, spontaneous recovery occurred after the animals were placed in the kennel.

CONCLUSION

Three years of observation and experimentation indicate that optimum physical surroundings and management procedures have been established for normal canine growth and development. It is believed that the study of canine gerontology, which this kennel will make possible, will provide information of wide application for both commercial breeders and experimental scientists.

SUMMARY

1) Basic animal husbandry principles were applied in establishing this kennel design and management.

2) Optimum pen size and shape was found to be 10 sq. ft. per inch of dog height in a rectangle of 1:2 proportions. Placing 2 unrelated females in each pen, with the pens arranged to allow group meetings, contributes to the contentment of the animals.

3) Eight to 9 in. of gravel covered with 1 to 2 in. of $\frac{1}{4}$ -in. crushed rock is preferred as the pen cover surface.

4) Individual oak barrels, mounted on a wood frame with a board covering, provide an economical and efficient doghouse. Bedding material is not necessary.

5) A compounded ration supplemented with a weekly feeding of fresh beef has proved to be an adequate diet. Oxtail is an excellent de-tartaring material. Eclampsia has not been observed in 150 litters on this diet.

6) One animal caretaker is required for every 52 dogs in the kennel. The daily removal of the feces from each pen ensures daily observation of the animals and prevents excessive odors. This daily human contact also improves the relationship between man and animal.

7) The infectious diseases which occurred in this kennel were observed to follow a definite pattern, diminishing as they spread. Internal parasites brought into the kennel have not been eliminated but remain at a low and subclinical level. Skin disorders, ectoparasites, and flying insects have not been a problem.

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Longhorn Cattle Federally Protected

The Texas Longhorn which was close to extinction twenty-five years ago is now maintained on national wildlife refuges under federal protection. Brought to America in 1851 by a Spanish governor general, these slow-growing, aggressive animals with a record horns spread of 8 feet have increased from 30 survivors to about 500. One herd of 376 animals is maintained at the Wichita Mountain Refuge near Cache, Okla.; another herd of 146 is at the Fort Niobrara National Wildlife Refuge near Valentine, Neb.—*Sci. News Letter*, Jan. 22, 1955.

Meat-Type Hogs Proved Superior

Pigs, farrowed by hysterectomy and raised in isolation on artificial diets under the "disease-free" system used at the Hormel Institute, Austin, Minn., in which environmental influences are reduced to a minimum, were subjected to carcass analysis when they reached a weight of about 200 lb. When divided on a basis of carcass fat, the leaner half averaged 7.2 per cent less fat than the fatter group. The lean group required 31 lb. less feed for 100 lb. of gain, gained 0.2 lb. more per pig daily, and yielded more of the high-priced cuts.—*The Hormel Farmer*, Feb., 1955.

Statistics on Food-Producing Animals

Livestock and poultry in the United States on Jan. 1, 1955, numbered 3 per cent greater than a year before, but 7 per cent less than the record number on Jan. 1, 1944. Cattle set a record with an estimated 95,433,000; the West North Central and western regions showed a 3 per cent increase, the South Central and South Atlantic regions a 1 to 2 per cent decrease chiefly because of recent droughts. The 24,408,000 dairy females was 1 per cent less than a year ago and 3 per cent less than the 1944-1953 average, with all but the North

Atlantic and western states showing a decrease. The hog population, which on Jan. 1, 1955, was estimated at 55,002,000 head (a relatively meaningless figure since so many are marketed before the year's end), was 13 per cent greater than a year ago. Sheep, estimated at 26,979,000 head, showed a decline of 1 per cent for the year. Horse and mule numbers continued to decline but at a slightly slower rate — 9 and 10 per cent, respectively. Horses have dropped from 8,081,000 to 3,106,000 in ten years, mules from 3,027,000 to 1,445,000. Chickens and turkeys showed a small increase.—*The Cattleman*, March, 1955.

Poultry Marketing

The largest cash decline for farm animals in 1954 was a 21 per cent drop for chickens, exclusive of broilers. The number marketed was up 4 per cent but prices averaged 24 per cent below 1953. Egg income also dropped 19 per cent, broiler income 4 per cent, and turkey income 8 per cent. Turkey hatchings in February, 1955, were down 21 per cent for heavy breeds and 35 per cent for light breeds. Turkeys eggs in incubators on March 1 were down 23 per cent for heavy breeds and 40 per cent for light breeds. In broiler production, Georgia was first with approximately twice as many as North Carolina which was in second place.—*Inst. Am. Poult. Indust.*, March 16, 1955.

Prehistoric Horse Bones in Wyoming

The Smithsonian Institute has found fossils of the earliest known horse in southwestern Wyoming. Known as *Hyracotherium*, the ancient horse had four functional toes and was about the size of a Shepherd dog. That this area had been a land of lush vegetation, 50 to 70 million years ago, was indicated by the teeth of the various fossil species found, one of which was the size of a Collie dog, but believed to be a distant relative of the rhinoceros.—*Sci. News Letter*, Feb. 12, 1955.

Viruses Cultured in Embryonic Fish.—Embryos of viviparous fish, recovered by hysterotomies, have been successfully used for culturing the eastern equine encephalomyelitis virus. This method may also be useful in studying other viruses.—*Sci. News Letter*, March 12, 1955.

The Veterinary Medical Profession in the Americas: Its Educational Program

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THE INTENT of this presentation is to discuss some of the basic concepts upon which education for the veterinary medical profession is based, and to present certain data concerning the institutions of the Americas that are presently engaged in the education of future members of the profession.

VETERINARY TERMINOLOGY

It may seem unusual that a discussion of this nature should begin with a discussion of terminology. Yet, from the remarks of colleagues in many countries, it is evident that they are not all thinking of the same thing when they speak of "veterinary medicine" and "veterinarians"; of *médicos veterinarios*, *veterinaria*, *veterinarios*, et cetera. It is necessary to find a common terminology if views are to be exchanged, and it is for this reason that the attempt is made here to analyze some of the terms used in relation to the profession. In fact, it would seem worthwhile to consider, first of all, the term "profession."

A profession is a calling characterized by considerable social power and a relatively high social status; by the high degree of technical skill of its members, with specialized preparation at recognized institutions of learning; by official regulation and licensure; by a strong feeling of group honor and solidarity, manifested in associations to secure a monopoly of the service, and in codes of ethics enjoining the responsibility of the profession to the collective it serves, as well as to society as a whole.¹ Veterinary medicine qualifies fully as a profession, even though in rare and isolated circumstances certain individuals or groups may have become somewhat lax in their observance of the professional code of ethics.

This paper was presented at the Second Pan American Congress of Veterinary Medicine, Sao Paulo, Brazil, April 1-10, 1954. It will appear in Spanish in the May, 1955, issue of the "Boletín de la Oficina Sanitaria Panamericana," published by the World Health Organization with regional office in Washington, D.C.

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There is a rather wide difference of opinion as to what the veterinary medical profession really is. Many believe that veterinary medicine is medicine applied to animals. In the words of Cameron,² "Medicine, of course, is medicine, and veterinary medicine is only part of an even greater association of which the most important—largely because of the value of the patient—is human medicine. There is no fundamental difference between human medicine and veterinary medicine. Both apply the same sciences to different animals and the main distinctions lie in economic consideration and in the varying value of signs and symptoms in the patient. We think of human medicine as consisting of component parts such as human anatomy, human physiology, human pathology, human pharmacology, and so on. Similarly, we consider equine medicine as consisting of equine anatomy, equine physiology, equine pathology, equine pharmacology, and so on. Bovine, canine, porcine, even amphibian or piscine medicine are similarly divided." If it can be agreed that "medicine is the science that has as its object the conservation and the restoration of health,"³ then veterinary medicine is the science that has as its object the conservation and restoration of animal health.

On the other hand, it is common practice in some countries to omit the word *medicina*, thus terming our profession *veterinaria*. It may well be that this omission is purposeful, and that *veterinaria* is not meant to connote the same thing as *medicina veterinaria*. *Veterinaria* is taken to include all sciences having to do with the production of animals. Thus, animal breeding, animal nutrition, and animal care are veterinary sciences, and animal medicine (whether curative or preventive) is only a limited part of total *veterinaria*. Sir Thomas Dalling, in a recent address,⁴ presented this concept clearly, when he said: "There has been a temptation, which may still exist, among some veterinarians to consider veterinary activities as being more allied to human medicine than to agricul-

ture. If we consider the duties of the profession to be confined entirely to disease problems, their study and control, then such views may be tenable; but, when we realize the wider scope of our activities, which in my view have to embrace the many aspects concerned with livestock, it becomes necessary to reconsider the position." According to this view, animal life and animal products come largely under the purview of those trained in veterinary activities and "work concerning animals should be dealt with by veterinarians."

It thus seems evident that *medicina veterinaria* and *veterinaria* do not hold the same meaning, and it is misleading to use the terms synonymously—as is often done. By the same token, there is a clear distinction between the terms *médico veterinario* and *veterinario*. The titles *médico veterinario* and *zootecnista* seem much more descriptive and are certainly less confusing.* Whether it is possible or practical to combine education in the two fields so that one individual is well qualified in both is a matter for serious doubt. On this point, Wilson⁵ said: "We must bear in mind that veterinarians are essentially professional men, while the animal husbandman is essentially a technically-trained businessman. The viewpoints of the two are different. Both are needed, but a man must be either one or the other. He cannot excel in both fields."

In 1949, a special commission studied

*These Spanish (and Portuguese) terms are translated as follows: *medicina veterinaria*, veterinary medicine; *veterinaria*, veterinary; *médico veterinario*, veterinary physician; *veterinario*, veterinarian; *zootecnista*, animal husbandman.

the educational programs in veterinary medicine and in animal husbandry in Central and South America, in accordance with a resolution of the Third Inter-American Conference on Agriculture (Caracas, 1945). The commission visited 14 schools of veterinary medicine and 16 agricultural schools. The report⁶ of the commission states: "In all the Latin American countries which have schools of veterinary medicine, the profession dominates not only veterinary medicine, but animal husbandry as well." The report noted that, in years past when the amount of knowledge concerning the two fields was not so great, it was possible for one man to master both. Today, however, it is not possible for one individual to be professionally competent in the prevention and cure of diseases of animals and also in management, nutrition, and breeding. Concerning almost all of the schools of veterinary medicine visited, the commission had to comment: "The training in animal husbandry is sufficient for veterinarians but is entirely too abbreviated for men who hope to become modern animal husbandmen."

It would seem most important and urgent that the members of the profession, and especially those who are directly concerned with our educational institutions, re-evaluate the situation and decide what shall be the type and extent of the training given to our colleagues of the future. The volume of scientific knowledge continues to grow and this continuing increase is the basic reason for the modern trend toward specialization in the various scientific fields.

TABLE I—Schools of Veterinary Medicine in the Americas in 1953

Name and location	Founded	Adminis- tration	Degree conferred	Entry	Fees	
					Annual	Others
ARGENTINA						
1. Universidad de Buenos Aires, Facultad de Agronomía y Veterinaria, Av. San Martín 4455, Buenos Aires	1904	National university	Doctor en Ciencias Veterinarias	0	0	200 pesos*
2. Universidad de Eva Perón (ex La Plata), Facultad de Ciencias Vete- rinarias, Calles 60 y 118, Ciudad Eva Perón	1889	National university	Doctor en Ciencias Veterinarias	0	0	0
3. Universidad del Litoral, Facultad de Agricultura, Ganadería e In- dustrias, Sargento Cabral 2105, Corrientes	1920 ^b	National university	Doctor en Ciencias Veterinarias	0	0	200 pesos*
BOLIVIA						
4. Universidad "G. R. Moreno," Facultad de Medicina Veterinaria, Santa Cruz de la Sierra	1940	National university	Médico Veterinario	0	0	0

(Continued on next page)

TABLE I (Continued)—Schools of Veterinary Medicine in the Americas in 1953

TABLE (Continued) — Schools of Veterinary Medicine in the Americas in 1946						
Name and location	Founded	Adminis- tration	Degree conferred	Entry	Fees Annual	Others
BRAZIL						
5. Escola de Medicina Veterinária de Bahia, Ondina, Salvador, Bahia	1952	State dept. of agriculture	Veterinario	?	?	?
6. Universidade Rural de Minas Gerais, Escola Superior de Veterinária, Gameleira, Belo Horizonte, Minas Gerais	1952	State dept. of agriculture	Veterinario	?	?	?
7. Universidade Rural, Escola Nacional Veterinária, Estrada Rio-São Paulo, Km. 47, Estado do Rio de Janeiro	1912	National agriculture ministry	Veterinario	60 cruzeiros	50 cruzeiros	500 cruzeiros
8. Escola Fluminense de Medicina Veterinária, Rua Vital Brasil Filho, Santa Rosa, Niteroi	1936	National agriculture ministry	Veterinario	60 cruzeiros	60 cruzeiros	500 cruzeiros*
9. Escola Superior de Medicina Veterinária de Pernambuco, Dois Irmãos, Recife, Pernambuco	1950	State dept. of agriculture	Veterinario	?	?	?
10. Escola Superior de Agricultura y Veterinaria do Paraná, Caixa Postal 672, Curitiba, Paraná	1951	National agriculture ministry	Veterinario	60 cruzeiros	50 cruzeiros	500 cruzeiros
11. Universidade de Rio Grande do Sul, Escola de Agronomia y Veterinaria, Porto Alegre, Rio Grande do Sul	1925	State university	Veterinario	?	?	?
12. Universidade de São Paulo, Faculdade de Medicina Veterinária, Rua Pires da Moura 157, São Paulo	1920	State university	Veterinario	?	?	?
CANADA						
13. Université de Montréal, Ecole de Médecine Vétérinaire, Saint Hyacinthe, Province of Quebec	1886	Provincial university	Docteur en Médecine Vétérinaire	\$5	\$5	\$ 15 ^a \$ 17 ^c
14. University of Toronto, Ontario Veterinary College, Guelph, Ontario	1862	Provincial university	Doctor of Veterinary Medicine	0	\$100	\$ 54 ^c \$ 10 ^a \$200 ^f
CHILE						
15. Universidad de Chile, Facultad de Ciencias Pecuarias y Medicina Veterinaria, Casilla 5539, Santiago	1927 ¹	National university	Médico Veterinario	2,200 pesos	2,200 pesos	400 pesos ¹
COLOMBIA						
16. Universidad Nacional de Colombia, Facultad de Medicina Veterinaria y Zootecnia, Apartado Postal 3161, Bogotá	1921	National university	Doctor en Medicina Veterinaria y Zootecnia	30.50 pesos	128 pesos	40.50 pesos*
17. Universidad de Caldas, Facultad de Medicina Veterinaria y Zootecnia, Manizales, Departamento de Caldas	1950	Departmental (provincial) university	Doctor en Medicina Veterinaria y Zootecnia	0	40 pesos	50 pesos*
CUBA						
18. Universidad de La Habana, Facultad de Medicina Veterinaria, La Habana	1907	National university	Doctor en Medicina Veterinaria	0	60 pesos	25 pesos ^a 10 pesos ^b 10 pesos ^c
ECUADOR						
19. Universidad de Guayaquil, Escuela de Medicina Veterinaria, Guayaquil	1948	Provincial university	Médico Veterinario	150 sucres	540 sucres	25 sucres ^a 465 sucres ^a
20. Universidad de Loja, Escuela de Medicina Veterinaria, Loja	1951	Provincial university	Médico Veterinario	50 sucres	70 sucres	250 sucres*
21. Universidad Central del Ecuador, Escuela de Medicina Veterinaria, Quito	1949	Provincial university	Doctor en Medicina Veterinaria	211 sucres	260 sucres	600 sucres*
MEXICO						
22. Universidad Nacional Autónoma, Escuela Nacional de Medicina Veterinaria y Zootecnia, Mexico 17, D.F.	1853	National university	Médico Veterinario Zootecnista	20 pesos	150 pesos	250 pesos*
PERU						
23. Universidad Mayor de San Marcos, Facultad de Medicina Veterinaria, Apartado 78, Las Palmas, Barranco, Lima	1946 ^a	National university	Médico Veterinario	0	200 soles	350 soles*

TABLE I (Continued)—Schools of Veterinary Medicine in the Americas in 1953

Name and location	Founded	Adminis- tration	Degree conferred	Fees		
				Entry	Annual	Others
UNITED STATES OF AMERICA						
24. Alabama Polytechnic Institute, School of Veterinary Medicine, Auburn, Alabama	1907	State university	Doctor of Veterinary Medicine	0	\$156	\$10*
25. University of California, School of Veterinary Medicine, Davis, California	1948	State university	Doctor of Veterinary Medicine	0	\$85	0
26. Colorado Agricultural and Mechanical College, School of Veterinary Medicine, Fort Collins, Colorado	1907	State college	Doctor of Veterinary Medicine	0	\$180	\$225*
27. Cornell University, New York, State Veterinary College, Ithaca, New York	1894 ¹	State university	Doctor of Veterinary Medicine	0	\$197	\$500*
28. University of Georgia, School of Veterinary Medicine, Athens, Georgia	1946	State university	Doctor of Veterinary Medicine	0	\$262	0
29. University of Illinois, College of Veterinary Medicine, Urbana, Illinois	1944	State university	Doctor of Veterinary Medicine	0	\$100	\$520* \$ 46 ²
30. Iowa State College, Division of Veterinary Medicine, Ames, Iowa	1879	State college	Doctor of Veterinary Medicine	0	\$150	\$210*
31. Kansas State College, School of Veterinary Medicine, Manhattan, Kansas	1905	State college	Doctor of Veterinary Medicine	0	\$180	\$10 * \$140*
32. Michigan State College, School of Veterinary Medicine, East Lansing, Michigan	1909	State college	Doctor of Veterinary Medicine	0	\$360	\$225*
33. University of Minnesota, School of Veterinary Medicine, St. Paul, Minnesota	1947	State university	Doctor of Veterinary Medicine	0	\$267	\$301*
34. University of Missouri, School of Veterinary Medicine, Columbia, Missouri	1946	State university	Doctor of Veterinary Medicine	0	\$150	\$ 5*
35. Ohio State University, College of Veterinary Medicine, Columbus, Ohio	1885	State university	Doctor of Veterinary Medicine	\$15	\$225	\$225*
36. Oklahoma Agricultural and Mechanical College, School of Veterinary Medicine, Stillwater, Oklahoma	1947	State college	Doctor of Veterinary Medicine	0	\$168	\$520* \$ 20*
37. University of Pennsylvania, School of Veterinary Medicine, Philadelphia, Pennsylvania	1883	State and private university	Veterinary Medical Doctor	\$5	\$70	\$600*
38. Texas Agricultural and Mechanical College, School of Veterinary Medicine, College Station, Texas	1916	State college	Doctor of Veterinary Medicine	0	\$50	\$500* \$ 27 ³
39. Tuskegee Institute, School of Veterinary Medicine, Tuskegee, Alabama	1945	State and private university	Doctor of Veterinary Medicine	\$10	\$156	\$250*
40. State College of Washington, College of Veterinary Medicine, Pullman, Washington	1899	State college	Doctor of Veterinary Medicine	\$100	\$161	0 ⁴
URUGUAY						
41. Universidad de la República, Facultad de Veterinaria, Montevideo	1903	National university	Doctor en Medicina Veterinaria	0	0	95 pesos*
VENEZUELA						
42. Universidad General de Venezuela, Facultad de Medicina Veterinaria, Apartado Postal 4565, Maracay	1936	National university	Doctor en Medicina Veterinaria	103 bolívares	300 bolívares	56 bolívares ^{a, b}

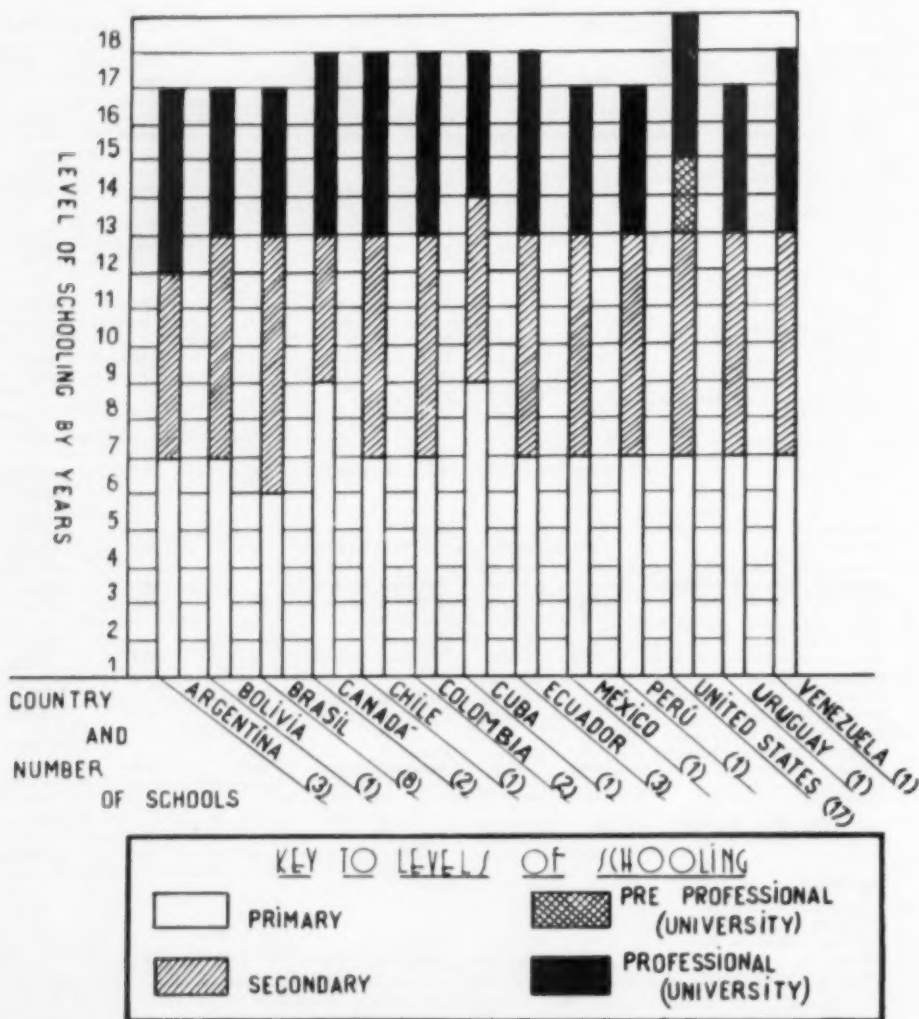
*Fee for degree; ^ainactive from 1935 to 1943; ^bstudent activities and/or medical service; ^chorsemanship fee required of first-year students; ^dfinal examination fee; ^eannual fee required for non-British subjects in addition to regular annual fees; ^fannual nonresidents' fee in addition to the regular annual fees; ^gper subject; ^hbegan in 1904 under auspices of Army; ⁱopened in 1896; ^jfounded earlier as an army school of veterinary medicine.

How can we afford to ignore that trend and the basis for it?

EXISTING EDUCATIONAL INSTITUTIONS

The foregoing remarks apply in a general way to veterinary medical education in the Americas. The remainder of the paper will be concerned with presenting facts about the specific institutions in this hemisphere that are now engaged in educating future doctors of veterinary medicine.

Table 1 is a list of the schools of veterinary medicine including certain facts about each. There are a total of 42 schools, operating in 13 countries. Our data are almost complete for all of these institutions. An overwhelming majority of the schools function within the university framework. Surely there can be little doubt that the association of veterinary medical schools with universities is highly desirable, particularly when the universities are recognized centers of intellectual culture



Graph 1—Years of formal schooling necessary to obtain the veterinary medical degree in the Americas (1953).

and when we perceive culture to be "the vital system of ideas of a period."⁷

The 42 schools of veterinary medicine vary greatly in age. The first to be founded was in Mexico in 1853—just 102 years ago—and every decade since then has seen the foundation of at least one new school in the Americas. It is noteworthy that 11 of the 42 were founded during the ten-year period, 1940 to 1949.

All but two of the schools are completely or largely dependent on public funds for their support; the other two also receive public funds, but are supported in part by money from private sources. More of the schools are dependencies of states or provinces than of national administration.

A wide variance is evident in the degrees or titles conferred by the different schools. Twenty-five offer the degree of doctor of veterinary medicine[†]; six assign the title *médico veterinario*^{**}; three confer the degree of *doctor en ciencias veterinarias*; eight offer the title *veterinario*. This variance in academic degrees or titles is an obvious result of the differing concepts of the scope, responsibilities, and limitations of the profession.

The amounts that the students must pay vary from school to school, and are direct reflections of the systems of financing university education in the different countries. In none of the schools does the amount charged for professional veterinary medical education appear to be unreasonable.

The minimum total number of years of formal schooling required for one to receive the professional title in veterinary medicine is shown in graph 1; the range in the 42 schools is from sixteen to eighteen years. There is remarkable agreement between the different institutions in the number of years required in the professional school at the university level. Thirty require four years and the remainder five years. In general, the five-year professional course is in effect in those countries which require fewer numbers of years of pre-professional education. Perhaps the four-

year schools limit their teaching more closely to professional or technical subjects than do the five-year schools. This, however, can be determined only from detailed analysis of curriculums—a matter that is beyond the scope of this survey.

Information concerning the size of the student body and the number of graduates per year for the schools of veterinary medicine is presented in table 2. The number of students registered is for the year 1953. One is immediately impressed by the great variation in the size of the student bodies of the different schools, which brings to mind the question: Are existing schools being utilized to the optimum extent?

The number of graduates per year during the ten-year period 1944 to 1953 bears out the marked differences in the output of the different schools. There is a definite tendency toward an increase in the total number of graduates per year in the Americas. This is accounted for, however, by the establishment of new schools rather than by larger graduating classes per school, as indicated by the over-all average size of graduating classes. In 1953, the average was 29—2 less than was the case in 1944. Even if we eliminate the University of Toronto from the 1953 averages (since there were no graduates that year due to the change to a 5-year course), we find that the average size of the 1953 graduating class was smaller than was the case in 1944.

At least one half of the schools should be capable of increasing the size of their student bodies without detriment to the quality of instruction received by the individual students. Such an increase in number of students would, in most cases, necessitate enlargements of teaching staffs and physical facilities but, even so, should result in a saving in cost per student. In the opinion of the author, the optimum size of classes for schools of veterinary medicine is 40 to 60 students per year. It is also believed that smaller classes—say less than 30 students per year—are uneconomical, considering that certain minimums in number of faculty members and in general facilities are necessary regardless of how small classes may be.

Surely, existing schools should be utilized to the optimum extent before serious consideration is given to the establishment of new ones. It was in this sense that the

[†]One of these schools awards the title in French, *Docteur en Médecine Vétérinaire*; six give the degree in Spanish, *Doctor en Medicina Veterinaria*; and two of the six have enlarged the title to *Doctor en Medicina Veterinaria y Zootecnia*.

^{**}Translated as "veterinary physician"; one of the six schools has enlarged the title to *Médico Veterinario Zootecnista* (Veterinary Physician Animal Husbandman) and another offers the additional title of *Médico Veterinario Graduado en Ciencias Pecuarias* (Veterinary Physician Graduated in Livestock Sciences).

TABLE 2—Students Registered in 1953 and Number of Graduates per Year, 1944 to 1953, in the Schools of Veterinary Medicine in the Americas

Designation of school	Students registered in 1953					Total	Number of graduates per year										Ave.
	1st year	2nd year	3rd year	4th year	5th year		1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	
ARGENTINA																	
Universidad de Buenos Aires	122	56	42	38	30	290	19	19	20	13	24	22	23	24	15	18	20
Universidad de Eva Perón	52	94	59	78	a	285	23	17	51	27	32	43	49	55	58	55	53
Universidad del Litoral	77	45	44	59	32	237	b	b	b	6	14	10	5	18	11	10	11
BOLIVIA																	
Universidad "G. R. Moreno"	2	2	2	2	c	2	e	3	8	3	7	2	5	2	4	2	4
BRAZIL																	
Escola Estadual Bahia	17	21	d	d	c	58	e	e	e	e	e	e	e	e	e	e	e
Universidade Rural Minas Gerais	39	19	21	15	c	92	7	6	5	6	9	5	12	8	15	13	8
Universidade Rural Nacional	21	26	14	24	c	85	16	9	4	6	27	15	16	14	17	23	15
Escola Fluminense (Niterói)	45	55	50	21	c	149	6	4	10	9	15	8	15	17	15	21	12
Escola Superior Pernambuco	26	26	18	16	c	86	e	e	e	e	e	e	e	e	e	16	16
Escola Superior Paraná	7	11	6	8	c	32	1	3	3	10	1	3	1	2	8	8	4
Universidade Rio Grande do Sul	12	11	12	17	c	52	6	6	6	6	13	7	6	12	9	17	9
Universidade São Paulo	26	33	14	16	c	89	7	13	7	18	9	17	11	12	22	16	13
CANADA																	
Université de Montréal	29	21	23	25	18	116	5	7	6	8	11	16	15	12	26	18	12
University of Toronto	64	56	61	64	74	319	19	38	21	37	43	117	127	114	93	0	61
CHILE																	
Universidad de Chile	76	45	33	31	30	215	13	9	9	5	15	9	11	17	24	15	13
COLOMBIA																	
Universidad Nacional	8	7	23	16	21	75	4	4	72	16	12	16	7	6	7	15	16
Universidad de Caldas	14	5	10	9	a	56	e	e	e	e	e	e	e	e	e	e	e
CUBA																	
Universidad de La Habana	99	53	41	45	c	198	7	12	14	18	31	30	16	24	26	37	22
ECUADOR																	
Universidad de Guayaquil	20	10	3	5	3	41	e	e	e	e	e	e	e	e	e	e	e
Universidad de Loja	19	5	0	5	d	29	e	e	e	e	e	e	e	e	e	e	e
Universidad Central (Quito)	29	12	8	9	8	66	e	e	e	e	e	e	e	e	e	e	e
MEXICO																	
Universidad Nacional	50	49	25	25	22	169	8	8	5	21	16	28	31	19	20	20	18
PERU																	
Universidad San Marcos	59	34	23	20	c	116	e	e	9	20	17	24	24	28	35	20	22
URUGUAY																	
Universidad de la República	34	15	16	19	c	84	23	8	15	22	12	6	20	15	25	15	16
U.S.A.																	
Alabama Polytechnic Institute	62	63	66	61	c	252	53	61	33	59	43	59	67	61	60	60	56
University of California	42	52	50	52	c	196	e	e	e	e	e	e	e	e	42	52	47
Colorado A. & M. College	65	61	58	54	c	238	76	34	46	20	32	43	63	58	56	59	49
Cornell University	52	48	49	46	c	195	43	61	37	35	1	41	50	47	48	46	41

[illegible]

*Fifth year added to become effective in 1991; school was inactive during this period; Four-year course; School recently founded—students had not yet progressed to this point; School too new for grades; Average number of graduates per year from all schools combined; these averages are computed by including only those schools in operation for the period concerned. The school in Bolivia is not counted in the averages for students registered in 1993.

First Pan American Congress of Veterinary Medicine recommended "that governments of countries that have no school of veterinary medicine make use of the facilities that can be offered by neighboring countries for the training of their veterinary medical personnel, and that the American governments study the possibility of reaching an agreement whereby fellowships would be maintained for the benefit of countries that have no school of veterinary medicine."⁸

It is not suggested that this survey is complete. On the contrary, it is hoped that this paper will serve as a point of departure for additional studies of veterinary medical education in the Americas. Numerous other aspects of the schools of veterinary medicine should be analyzed on a comparative basis. Undoubtedly the most important asset of a school is its teaching staff. The faculty determines the quality of the institution; it should be composed of men who not only have faith in the value of education of others, but who also have a continuing desire to add to their own knowledge. Studies should be made of the teaching staff in the schools of veterinary medicine to determine the ratios of professors to students; the qualifications of professors in the subjects which they teach; their hours, salary, and other conditions of employment.

Another aspect that should be studied in veterinary medical schools is curriculum. It has been said that the "curriculum is the loom on which the cloth of education is woven"; the student must weave his own fabric, but he is guided, stimulated, and taught by the faculty, "which is responsible for the design."⁹

In addition to the faculty and the curriculum, other features of the schools that should receive objective study are admission requirements, student selection, and grading systems; buildings; equipment; library facilities; and administrative practices. All of these are of vital importance to modern educational institutions.

The First Pan American Congress of Veterinary Medicine, considering that veterinary medical education needed greater coordination, recommended "that the American republics, on a coordinated basis, form a Pan American committee on education for the purpose of making periodic visits

to the schools of veterinary medicine in the Americas and suggesting measures designed to improve these schools.¹¹⁰ Surely, this need for coordination is still great. Whether such coordination is to be effected through a Pan American committee, through international meetings of educators, or by other means, is a matter that awaits decision. In any event, there is a pressing need for sponsorship of a program for promoting continuous improvement in the veterinary medical schools in the Americas.

A distinguishing feature of every profession is the long and arduous formal training which the individual undergoes before he qualifies for practice. It is no exaggeration to say that a profession is as good or as bad as the educational base on which it rests. It is thus essential that all veterinarians maintain a continuous and active interest in professional education.

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Measurements of Viruses.—As determined by ultrafiltration methods, the size of the virus of equine infectious anemia was established as 60 to 95 m μ and of dog

distemper virus as 70 to 105 m μ .—*Vet. Bull., Feb., 1955.*

Human Anthrax of Unknown Source

A London storekeeper developed a pimple on his neck where an insect had bitten him the day before. The next day he became ill and showed no response to single daily injections of penicillin. By the fifth day, he was delirious and the lesion had become an ulcer 1 inch in diameter with a raised edge in which many small vesicles surrounded a blackish central slough. The swelling extended from his ear to his chest. He was then given penicillin, 300,000 units 4 times daily for seven days, and improved rapidly. The diagnosis was confirmed by guinea pig inoculation. A similar case was reported in a woman in the same area, also following an insect bite. An exhaustive search failed to reveal a source of infection by contact and animal anthrax was unknown in the district.—*Brit. Med. J., Jan. 8, 1955.*

(In the Jan. 29, 1955, issue of the *British Medical Journal*, a correspondent suggested that the inoculating insect may have picked up the organism from bone meal used as garden fertilizer.)

Heat Tolerance and Skin Area

Although Jersey-Red Sindhi crossbred cattle were more tolerant to heat than purebred Jerseys, when a comparison was made of the skin surface area to the body weight of 23 and 32 cows, respectively, there was no significant difference between the two groups.—*J. Dai. Sci., Dec., 1954.*

[See JOURNAL, Oct., 1954: 302, for a different finding.—ED.]

Cortisone for Arthritic Patients

Cortisone therapy for persons with rheumatoid arthritis and related arthritic conditions has been financed by the New Jersey Rehabilitation Commission. After the treatment of 25 patients for eleven months, ending March 1, 1952, the results were questionable in 15 and good in ten. Fifteen months later, reports on 22 of these patients showed 15 working full or part time (4 as housewives); two partly rehabilitated and five not rehabilitated. Symptoms were absent in two patients, slight in four, moderate in 12, and still severe in three.—*Cortisone Investigator, Dec., 1954.*

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

Use of Traction for Dystocia in the Cow

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THE SKILL with which a clinician handles a case of dystocia depends upon how well he can make his scholastic (fundamental) preparation meet the peculiar demands of practice.

Because the obstetrician has little time for preparation, and no dependable information to guide him prior to the examination of the patient, it is difficult to know just what to take along. It is helpful to keep equipment in one unit or container that can be picked up quickly and which will include the essentials for handling common dystocias, i.e., rubber suit and boots, appropriate clothing, towels, soap, disinfectant, lubricant, rubber catheter, large syringe, hypodermic syringes and needles, irrigating can, ropes and obstetrical chains, procaine, antibiotics, and sulfonamides.

With a few additions to meet the needs of different operators, this list will take care of the majority of dystocias. Most cases yield to correction by retropulsion, flexion and extension, and rotation, followed by moderate traction. But when difficulties arise, patience, skill, and endurance are taxed. The balancing of factors involved requires judgment that has been tempered by training and experience.

One must determine at the earliest possible moment what techniques are applicable and whether one can handle the case under existing circumstances and environment, or if additional equipment, facilities, and assistance are imperative.

In general, there are four ways to deliver a fetus—mutation, forced extraction, embryotomy, and laparotomy. This discussion will be confined to the use of force.

It is assumed that appropriate measures have been taken to protect the mother

against injury and to safeguard the life of the fetus. This includes the liberal use of soap and water, a thorough lubrication of the mucous membranes and the body of the fetus, and the correction of malpositions.

When, in the opinion of the operator, the use of force is necessary, then it becomes a problem of how and when it can be used to the best interests of the patients.

I have long been critical of the equipment used to apply traction and the extent to which most of us have been guilty of using it. It is fortunate indeed that the pelvis of the cow is stout and the tissues capable of absorbing cruel abuse. Usually, the amount of traction necessary is in reverse proportion to the skill of the operator. If it can be limited to one man, probably that is the best source of power. The requisites are to be able to deliver a reasonable pull in any direction, up or down, to the right or left, or in a circle. More important still is the provision for immediate release upon a signal or word from the obstetrician.

It is common knowledge that levers, wire stretchers, windlasses, horses, and tractors have been used. Let us admit that the best we have at the moment is still not good enough.

Most of us have made the mistake of carrying force to the limit, jeopardizing the lives of the mother and fetus before resorting to other means. During this unsuccessful effort, strength may have been wasted, morale lowered, and the resistance of the patient sacrificed. It is admitted that in the absence of proper equipment, adequate preparation, favorable environment, sufficient experience, and training, one is justified in taking risks associated with traction that would not be condoned under different circumstances. But since trying conditions are the rule in veterinary practice, we accept them as such and adopt

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measures that enable us to render a valuable service in spite of the handicaps.

Since the use of force is necessary in many instances, the refinement of methods for developing power and its humane use are challenging. Machines for developing power have been in use in Europe for a great many years. One model consists of a horse-collar arrangement (serving as a pelvic girdle and base for a tripod) (see Fleming's *Obstetrics*, 3rd. ed. p. 380). It is heavy, awkward, and lacks mechanical convenience, safety, simplicity, and probably was expensive.

The apparatus described here is sturdy, light (3 or 4 lb.), inexpensive, and neat. It develops about three manpower, certainly more than we like to use. The replaceable cord that forms the circular base of the tripod is placed against the pelvis, with one foot of the tripod on each side and one ventrally, and adjusted to a size that will permit the easy passage of the fetus through it (perhaps 12 in. in diameter). One of the pulleys is then hooked onto the obstetrical chains that have already been placed over the limbs or head. It is the function of the veterinarian to direct

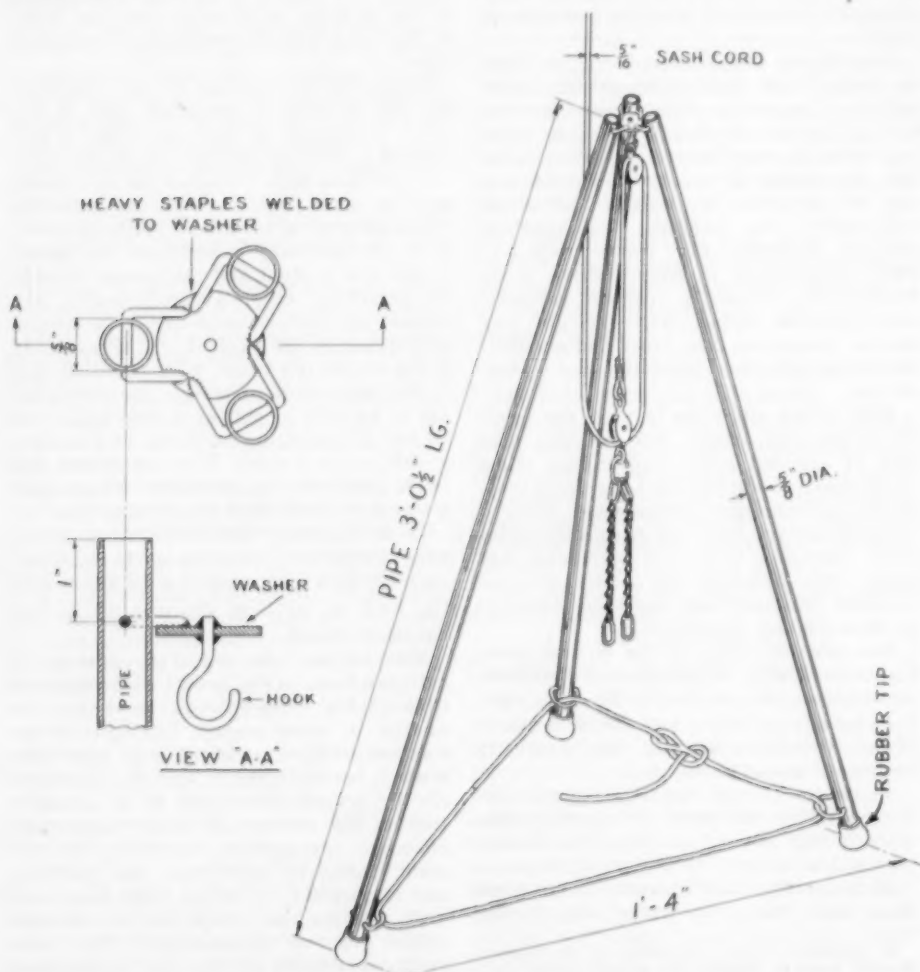


Fig. 1—A sturdy, inexpensive apparatus for traction in bovine dystocia.

rather than participate in the traction, except where occasional lift is necessary. He must avoid contamination which would expose the patient to infection. His province is within the genital tract, locating dangerous stresses and preventing (at least reducing) trauma by lubrication and patient dilatation.

During the early days of my practice, an experienced obstetrician said to me, "Your trouble is that you do not know when or how to repel." It was valuable and constructive criticism. Retropulsion permits re-examination and orientation. Relaxation gives time for folds of mucous membranes to "let-go." It allows advantageous changes in direction and kind of traction. Traction should be shifted from one side to the opposite, sliding the limbs alternately a little at a time along the body of the fetus, thereby narrowing its diameter and facilitating its passage through the tight places in the pelvis.

Traction can be used safely provided it is accompanied by rigid limitation and skillful guidance. It is always associated with risk. The risk is to be calculated in comparison to the chance of success by embryotomy or cesarean section.

It is easy to apply traction and it often takes courage to abandon it for safer methods.

Inherited Defects of the Dog

Genetic defects in dogs are common, one of the most common being a superior prognathism—a lengthening of the upper jaw. Affected animals, although fully vigorous, should not be used for breeding. Hemophilia, an infrequent defect, is an inherited sex-linked recessive characteristic. It has occurred in Britain in the Aberdeen Terrier, in the Dutch East Indies in Greyhounds, and possibly in Denmark in Scottish Terriers. Another defect which occurs is progressive atrophy of the retinal receptor cells associated with a reduction of the retinal blood vessels. The resulting defective vision appears first at night and later in the daytime. The disease has been reported in Gordon Setters and Irish Setters.

Hemolytic disease of newborn pups (similar to erythroblastosis fetalis caused by the Rh factor of man) has been reported. Five antigenic factors defined as antibodies ap-

pear to be inherited as simple dominants. Cryptorchidism may be either unilateral or bilateral, inguinal or abdominal. Dogs suffering from this inherent defect are of uncertain disposition and the retained testicles are prone to develop tumors. The relatively large amount of uric acid excreted by Dalmatians is due to a dominant inherited kidney anomaly.

In merle coats, dominant spotting defects occur in Dachshunds, Collies, Shetlands, Sheepdogs, and Foxhounds. These defects are frequently accompanied by walleys, ocular anomalies, marked depigmentation of the coat, and frequently deafness. Posterior paralysis in Great Danes and Saint Bernards seems to be caused from spinal cord defects. Little is known about genetic influences on disease resistance and fertility but Bloodhounds may be especially susceptible to distemper. Inheritance may be a factor in nervous defects such as fits in Bull Terriers, cramps in Scottish Terriers, and permanent trembling of the hind quarters of Airdales. Albinism occasionally occurs and probably is recessive. Umbilical hernia is probably hereditary in certain breeds. Some forms of rickets, goiter, and eczema may have a hereditary basis.—*Vet. Rec., Jan. 1, 1955.*

[Inferior prognathism, a common inherited defect observed in America, was not mentioned.—ED.]

Sex Reversal in a Chicken

An 18-month-old Leghorn chicken ceased laying regularly and commenced to crow like a rooster. On necropsy, the ovary had two yellowish, rounded bodies attached to it, the larger the size of a hazelnut. Microscopically, these bodies were highly cellular with some cells arranged in alveolar groups suggestive of seminiferous tubules. Such tumors are known as arrhenoblastomas.—*Canad. J. Comp. Med. and Vet. Sci., Feb., 1955.*

Inheritance of a Skull Defect in Dogs.—An apparently recessive cranial defect, which was lethal, is reported in highly inbred Cocker Spaniel puppies. The soft spots were caused by failure of the cranial bones to unite during early life.—*Vet. Bull., Nov., 1954.*

Estrogen and Endometrial Cysts

Cystic glandular hyperplasia of the endometrium was induced in ovariectomized and entire guinea pigs by injecting 5 mg. of estradiol benzoate intramuscularly three times a week for seven or eight weeks, and also by feeding subterranean clover for seven or eight weeks. The condition persisted long after treatment was terminated, although not interfering with the estrous cycles. No cysts occurred in those fed red clover.—*Vet. Bull., Jan., 1955.*

Dangers of Overterm Pregnancy

Overterm infants become hypermature and damaged as soon as the intrauterine resources become inadequate for further growth. The placenta no longer can provide the food, oxygen, and fluid requirements so the amniotic fluids progressively decrease. The fetus not only is larger but its skeleton is more ossified which causes more difficulties in delivery. Hormone imbalances may be involved in the prolonged pregnancy.—*J. Am. M. A., Jan. 15, 1955.*

Dwarf Inheritance in Beef Cattle

Breeding tests indicated that the inheritance of a dwarf anomaly is attributable to autosomal recessive genes. Ninety matings between heterozygous parents produced normal and dwarf offspring in a ratio of about 3:1. Five matings between dwarfs resulted in dwarfism in all the offspring. Six matings between dwarf bulls and heterozygous cows resulted in a normal to dwarf ratio of about 1:1. When a dwarf sire was mated with females from herds free of dwarfism, the progeny were normal.—*J. Anim. Sci., Feb., 1955.*

Hydrops Amnii in a Cow

A cow carrying her second calf was hospitalized as a possible case of traumatic reticulitis. Upon rectal examination, the fetus was palpable but excessive uterine fluids were not noticed. A few days later, the abdomen was enlarged, the uterus distended with fluid, but the calf could no longer be palpated. A 1/2-inch cannula was passed through the right flank and left in position for twenty-four hours. The uterine fluid which escaped at intermittent intervals totaled 15 to 20 gal. Stilbestrol (100

mg.) was given subcutaneously daily for four days. On the fifth day, the cervix would admit a finger, so 100 mg. of stilbestrol was injected directly into the uterus. The fetus, small for its age, was aborted on the sixth day and the fetal membranes were removed manually a few days later. Meanwhile, the cow showed steady improvement and recovered. A total of 500 mg. of stilbestrol was used.—*Irish Vet. J., Jan., 1955.*

Pheasant-Turkey Hybrids

Hybrids from Ring-Necked pheasants and Broad Breasted Bronze turkeys have been produced in each of the past three years. About one in eight eggs has hatched—the pheasant eggs in twenty-six days, the turkey eggs in twenty-seven or twenty-eight days (pheasant eggs usually hatch in 24 days, turkey eggs in 28). The mature hybrids are intermediate in weight between the two species, with heads resembling a pheasant but with no feathers around the eyes; the tail feathers are intermediate in length and the plumage is dark brown to black. Like the pheasant-domestic fowl hybrids, all are apparently sterile. Artificial insemination is an aid in producing hybrids.—*Science, Feb., 25, 1955.*

Interval for Postpartum Involution

When the interval from parturition to involution of the uterus in 252 calvings and from parturition to the first estrus in 322 calvings were studied, the average interval to involution was forty-seven days and to the first estrus thirty-three days. Involution required forty-two days in the primiparous, fifty days in pluriparous, cows and it also was affected by the seasons, being shortest in the summer and fall. The interval to estrus also was shorter in the summer.—*J. Dai. Sci., Jan., 1955.*

Human Abortions from Salmonella Infection.—In an area of Italy, where *Salmonella abortusovis* infection was prevalent in sheep, blood samples from 11 women (shepherds' wives) who had aborted revealed four with titers of 1:80 to 1:640 against *S. abortusovis*. Two of the shepherds were also positive.—*Vet. Bull., Oct., 1954.*

A Small Bowel Obstruction in the Dog —Roentgen Diagnosis

WILLIAM D. CARLSON, D.V.M., and
STUART A. PATTERSON, M.D.

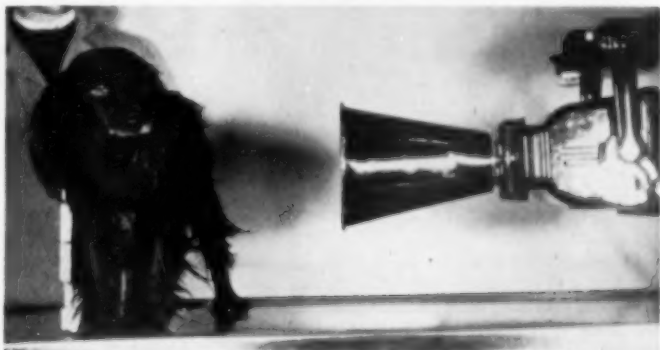
Fort Collins, Colorado

The purpose of this report is to emphasize the usefulness of radiography in the confirmation of the clinical diagnosis of a small bowel obstruction. Further, it is hoped that the value of using the standing lateral position in studies of this nature will be demonstrated. (This position simulates the lateral decubitus position used in human radiology.) This position is simple and can be easily adapted to special prob-

vomiting, and a profuse watery diarrhea for five days. Clinical examination showed the dog to be in a state of cachexia and marked dehydration. Digital palpation of the abdomen indicated that a portion of the small bowel was distended with gas. A tentative diagnosis of intestinal obstruction was made and a radiological examination ordered.

Plain films (before the administration of a radiopaque substance) were made in the dorsoventrad, lateral, and standing lateral positions. The lateral and dorsoventrad films showed gas trapped in the intestines but they were not conclusive. However, the standing lateral film beautifully demonstrated gas-capped fluid levels (fig. 2)

Fig. 1—A dog in the standing lateral position with the x-ray tube and film in place.



lems. The animal is placed in the standing position and the x-ray tube is placed on a horizontal plane parallel to the floor. The film is held beside the animal opposite the tube side (fig. 1). Films are exposed in the ordinary manner. The results obtained should be rewarding and can add to the diagnostic tools of the general practitioner without monetary investment.

CASE HISTORY

On Oct. 16, 1954, a 7-month-old hound was referred to the Colorado A. & M. veterinary hospital with a history of anorexia,

which are considered significant in the diagnosis of a small bowel obstruction.¹⁻⁴ The x-ray films confirmed the clinical diagnosis and surgery was suggested.

On Oct. 19, 1954, a celiotomy was per-

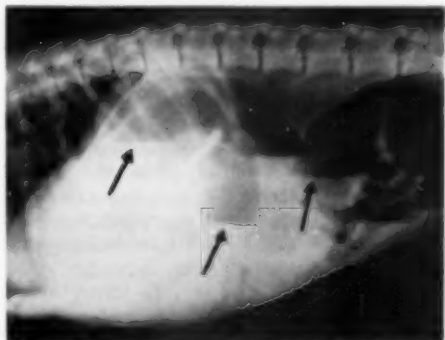


Fig. 2—Radiograph of the hound showing gas-capped fluid levels (arrows) in the intestinal tract.

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The authors express their appreciation to Dr. W. V. Lumb, Department of Surgery and Clinics, Colorado A. & M. College, who performed the surgery, and to Dr. L. C. Moss, head, Department of Medicine, Colorado A. & M. College.

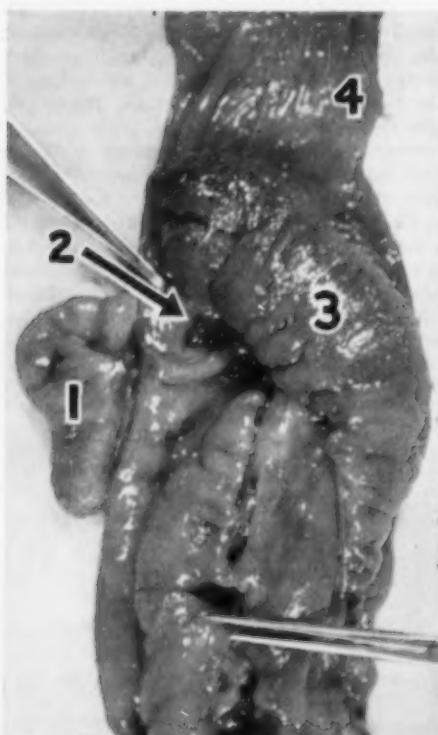


Fig. 3—Intussusception after surgical resection: (1) cecum; (2) ileocolic orifice, incised longitudinally; (3) intussusception; and (4) colon.

formed and an intussusception was found involving 14 inches of the small intestine inverted within itself and extending half this distance through the ileocolic orifice. Reduction of the intussusception being impossible, it was necessary to remove all the involved section of the ileum, cecum, and colon (fig. 3). The ileum was anastomosed to the colon.

The postoperative recovery of the dog was prolonged due to the presence of diarrhea which did not respond immediately to therapy. On Dec. 14, 1954, the animal was released from the hospital after the diarrheal condition had improved. A report on the dog, Jan. 14, 1955, indicated that it was asymptomatic.

SUMMARY

A case history of a small bowel obstruction caused by an intussusception of the ileum through the ileocolic orifice into the

colon is reviewed. Confirmation of the diagnosis of a small bowel obstruction was made radiographically. The standing lateral position with the transabdominal projection of a horizontal x-ray beam demonstrated gas-capped fluid levels, which were a significant diagnostic aid. Surgical resection of the intussusception was performed.

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Spontaneous Uterine Rupture.—A 31-year-old woman whose third delivery was by cesarean section was again operated on at her fourth delivery fifteen months later. Although active labor had been brief, the uterus had ruptured spontaneously at the site of the last operation. After delivery and a transfusion, she recovered.—*J.Am.M.A., Feb. 12, 1955.*

Venereal Granuloma of Dogs

When 0.51 ml. of saline cell suspension from a metastatic iliac node of a transmissible venereal tumor was injected into the subarachnoid spaces of 4, 2-month-old puppies (2 through the occipital space and 2 through the trephined skull), all developed nervous symptoms in two weeks and died at thirty to forty-three days. Tumors were found at the inoculation sites.—*Vet. Bull., Nov., 1954.*

Chinchillas, like many other rodents, all have essentially the same blood type, so if transfusions were needed typing would not be necessary.—*Sci. News Letter, Feb. 26, 1955.*

CLINICAL DATA

A Recent Case of African Swine Fever in Kenya, East Africa

R. A. HAMMOND, O.B.E., M.R.C.V.S., and D. E. DeTRAY, D.V.M.

Kabete, Kenya

ON JULY 20, 1954, a pig submitted for necropsy to the field veterinary officer at Nanyuki showed inflammation of the stomach and intestines. Two other pigs of the herd of 178 died and several more were sick. Because all the pigs involved had been moved recently to a new paddock, plant poisoning was suspected. On July 26, a second pig presented for necropsy showed marked hemorrhages of the lymph glands, free blood in the stomach with no visible inflammation of the mucosa, streaks of subserosal hemorrhage on the large intestines, bloody feces, subcapsular petechiae on the kidneys (turkey egg appearance), and a few spots of subendocardial hemorrhage. Citrated blood, blood in O.C.G.,^{*} and lymph glands in glycerine were sent to the veterinary laboratory at Kabete. By this time 10 pigs were dead. The veterinary officer made a tentative diagnosis of African swine fever and immediately placed the farm on provisional quarantine pending laboratory confirmation.

His diagnosis was confirmed at the laboratory. Bacteria-free filtrates from the submitted tissues produced typical African swine fever in inoculated pigs. Hog cholera antiserum in massive doses had no effect on this virus.

By July 29, 18 pigs had died and about 30 per cent of the remaining 160 were visibly sick. Temperatures of sick pigs ranged from 105 to 108 F. Many of the pigs were down and when forced to move showed a marked weakness characterized by an involuntary swaying movement of the hind quarters. Some advanced cases had convul-

sions and muscular tremors. Marked cyanosis of the skin was common and superficial spots of skin hemorrhage were observed. Necropsy of several typical cases showed lesions as described above. Additional lesions were observed as follows:

- 1) A large amount of yellowish fluid was present in the pericardial sac and peritoneal cavity.
- 2) The mucosa of the urinary bladder was congested and a few petechiae were present.
- 3) The spleen was dark and soft; 1 pig's spleen was twice normal size.
- 4) The blood vessels of the gallbladder were engorged. Free blood was present in the gallbladder of 1 pig.
- 5) Free blood was present in the kidney pelvis of 1 pig.
- 6) Streaks of hemorrhage and petechiae were found on the serous surface of the stomach. A marked gastritis was seen in some cases.
- 7) Petechiae and ecchymoses were seen on the lung surface.
- 8) The cecal mucosa showed marked hemorrhagic inflammation.

EPIZOOTIOLOGY

The owner reported that 650 wart hogs had been killed on his farm since 1949 in an effort to exterminate these inapparent carriers of African swine fever.

Just prior to this outbreak, a wart hog was killed within 500 yards of the pig paddocks which were double-fenced to prevent contact between domestic and wild swine. No evidence was found to indicate that direct contact occurred.

Walker¹ has suggested that an intermediate host, probably a winged insect, may be responsible for the transmission of African swine fever among wild pigs and from wild to domestic pigs. On this farm, we noted two possibilities of mechanical transmission from wart hogs to domestic pigs: (1) Vultures recently seen in the paddocks may have carried virulent material from dead wart hogs; and (2)

^{*}Dr. Hammond is from the Department of Veterinary Services, Kenya; and Dr. DeTray, the Animal Disease and Parasite Research Branch, Agricultural Research Service, U. S. Department of Agriculture, Washington, D.C.

The assistance of G. Froyd, M.R.C.V.S., the government veterinary officer at Nanyuki, is gratefully acknowledged.

^{*}O.C.G. = glycerine, 500 ml.; water, 500 ml.; sodium oxalate, 5 Gm.; and carboic acid, 5 Gm.

natives engaged in killing wart hogs had cut up the carcasses for dog food. They or the dogs may have acted as mechanical carriers.

We isolated African swine fever virus from the blood of an apparently normal wart hog sow killed on the farm on Sept. 27, 1954. Blood from a young wart hog, killed with this sow and undoubtedly her pig, did not produce infection. Blood from a third wart hog killed on July 27, 1954, was also noninfectious.

CONTROL

All surviving pigs on the premises were slaughtered and incinerated immediately after laboratory confirmation of the diagnosis of African swine fever was obtained. Surrounding farms were quarantined for four weeks, during which time no extension of infection occurred.

DISCUSSION

African swine fever was first diagnosed and described by Montgomery² in 1910. He recorded 14 outbreaks from 1910 to 1912, involving 1,276 swine of which 1,263 (98.9%) died. Early in his investigations, Montgomery found that outbreaks among domestic pigs invariably began on farms where wart hogs (*Phacochoerus* sp.) and bush pigs (*Potamochoerus* sp.) were to be found in the wild state. As settlement of the Colony progressed, the wild animals were steadily driven back and outbreaks of swine fever in domestic pigs diminished; during the period 1913 to 1944, there were 60 outbreaks recorded, but since 1944 there have been only four such outbreaks.

Although Walker had shown that hyperimmune African swine fever serum had some protective value, attempts at the production of an efficient crystal violet vaccine had not been successful. Immunization of pigs has never, therefore, been a feature of control measures in Kenya. By 1944, outbreaks were so infrequent that it became possible to adapt a slaughter policy for the rapid suppression of outbreaks; compensation is paid to the owners of slaughtered herds, and this policy has undoubtedly proved effective.

By 1948, pig production by European farmers in Kenya had reached a stage at which there was an exportable surplus, and Great Britain provided the obvious market. Safeguards against the introduction of African swine fever virus into Britain were

obviously necessary and after negotiations between the veterinary authorities of the two countries it was agreed that pigs for export from Kenya should be drawn only from specifically defined areas in which no outbreaks of this disease had occurred among domestic pigs during the previous ten years. As an added precaution, vigorous steps were taken to reduce the possibilities of contact between wild and domestic pigs; legislation requiring the enclosure of pigs at all times was enacted, movement of pigs became subject to veterinary control, and the payment of a bounty of 5 shillings for each wart hog destroyed was introduced.

The success of this policy is shown by the fact that since 1944 there have been only four outbreaks of African swine fever: one in 1947, two in 1950, and one in 1954. Bounty payments for 2,569 wart hogs have been made during the last five years.

The 1954 outbreak has several interesting features. The farm involved is only 12 miles from the site of the previous outbreak, in April 1950, and is in an area where wart hogs are still numerous despite their systematic destruction by shooting and hunting with dogs. It appears that the virus has survived in wart hogs, without infection spreading to domestic pigs, for a period of at least four years.

Although both Montgomery² and Walker¹ infected captured wild pigs at the Kabete laboratories, as far as we can determine this is the first occasion upon which African swine fever virus has been recovered from a wart hog killed at large in Kenya; South African investigators^{3,4} recovered the virus from apparently healthy wart hogs shot in areas where the disease had occurred in domestic pigs, but blood obtained from wart hogs shot in other areas proved to be noninfectious.

SUMMARY

A recent outbreak of African swine fever in Kenya is described. The virus was isolated from domestic pigs and from 1 wart hog killed on the farm. Immediate quarantine, slaughter of all domestic swine, and burning the carcasses prevented this outbreak from spreading to adjoining farms.

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Furacin in the Treatment of Ovine and Caprine Coccidiosis

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P. DRAGONAS, D.V.M.

Athens, Greece

Ovine and caprine coccidiosis are common in Greece, occurring chiefly in the early spring and sometimes assuming serious proportions. This disease is nearly always seen in young animals 1 to 2 months old, the chief lesions consisting of white patches, 1 to 2 mm. in diameter, visible even through the intact intestinal wall. The common symptoms are anorexia, depression, and profuse white diarrhea often streaked with blood.

Our treatment of coccidiosis has consisted of *per os* administration of sulfamethazine or sulfaguanidine,¹ 100 to 250 mg. per kilogram of body weight daily for seven days. The results have not always been satisfactory, especially in kids.

The excellent results reported with furacin,^{2,3} in the prevention and control of coccidiosis in chickens^{2,3} and pigs,³ prompted us to undertake a series of experiments in order to determine the value of this drug

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The authors are indebted to Eaton Laboratories, Norwich, N. Y., for supplies of furacin; to Dr. H. D. B. Roberts for his valuable suggestions; and to Drs. P. Veiglu and J. Cardassis for their cooperation.

*Furacin is the brand of nitrofurazone (5-nitro-2-furaldehyde semicarbazone).

in controlling the comparable disease in lambs and kids.

In January, 1954, the cadaver of a kid from the Boeotia district was sent to the laboratory of the Microbiological Institute with a request for a diagnosis of the causative disease, as severe outbreaks had occurred in five counties of this district. This outbreak involved both kids and lambs, with a mortality of 70 to 80 per cent in the kids and 20 to 40 per cent in the lambs. The necropsy revealed an acute intestinal coccidiosis due to *Eimeria faurei*.

A supply of furacin was then obtained, 7 mg. of the drug per kilogram of body weight was mixed with a spoonful of sugar and, because of their anorexia, was given individually to the diseased animals, daily for a week.

On the third day of treatment a considerable improvement was observed, followed by complete recovery except for a few fatalities in the outbreak at Tsoukalades (table 1).

As controls, half of the diseased animals were given, orally, 250 mg. of sulfaguanidine per kilogram of body weight daily for seven days. The results were far less satisfactory than those with furacin (table 1).

In a second series of experiments, the daily dosage of furacin was increased to 10 mg. per kilogram of body weight daily for seven days, with better results and without any side effects (table 1).

Since the *per os* therapeutic dose in pigs is about 50 mg. per kilogram of body weight daily and the single, fatal *per os* dose is about 300 mg. per kilogram of body weight,⁴ the daily dosage in lambs and kids might well be increased. Experiments using a higher dosage of furacin in comparison to sulfamethazine are planned. The single, *per os*, minimal fatal dose of furacin for adult goats is reported to be about 700 to 900 mg. per kilogram of body weight.⁵

TABLE 1—Comparative Therapeutic Effects of Furacin and Sulfaguanidine for Ovine and Caprine Coccidiosis

District	County (or city)	Animals treated		Mortality rate (%)		
		Kind	No.	Furacin (7 mg./kg.)	Sulfaguanidine (250 mg./kg.)	Furacin* (10 mg./kg.)
Boeotia	Delphi	Lambs	50	0	—	—
Boeotia	Delphi	Lambs	50	—	6	—
Boeotia	Akretnon	Lambs	50	0	—	—
Boeotia	Akretnon	Lambs	25	—	5	—
Boeotia	Tsoukalades	Kids	50	5	—	—
Boeotia	Tsoukalades	Kids	100	—	12	—
Boeotia	Chryson	Kids	100	—	—	0
Thessaloniki	Thessaloniki	Lambs	42	—	—	0

*Furacin (10 mg./kg.) was tested in the second series of experiments.

SUMMARY AND CONCLUSIONS

Furacin® seems to be a highly effective antioocidial agent in lambs and kids.

The oral dosage employed in two series of experiments has been 7 and 10 mg. per kilogram of body weight, daily for seven days.

The 10-mg. dosage produced better results as no mortality occurred among the treated animals.

Furacin has the advantages over sulfaguanidine of being more effective and less expensive when calculated on a dosage basis.

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Cholera in Piglets from Immune Sows

Tests indicated that an acute disease, which was checked by vaccination when it affected about half of 183 pigs 2 to 3 weeks old, was hog cholera. The dams, vaccinated with a modified virus and serum a year earlier, did not sicken. The disease was complicated by a severe pneumonia. Some pigs responded favorably to 300,000 units of penicillin and 30 cc. of hog cholera antiserum, indicating that they were not totally susceptible.—*Fort Dodge Bio-Chem. Rev.*, No. 3, 1954.

Foot-and-Mouth Disease in Children.—

Foot-and-mouth disease virus, type C, was confirmed serologically both in children and in cattle of a community in Poland. The children showed a rise in temperature, vesicles the size of a pea appeared on their fingers and toes, also on their tongues, gums, lips, and cheeks. Their regional lymph nodes were swollen.—*Vet. Bull.*, Jan., 1955.

Vascularization—Its Significance in Diseases of the Cornea

A Reprint

W. G. MAGRANE, D.V.M.

Mishawaka, Indiana

Most diseases of the cornea result in its vascularization, and the type of vessels and their location in the cornea is often a clue to the nature of the disease process. Once this process is understood a more accurate prognosis is possible and the proper choice of treatment determined.

The purpose of this paper, then, is to attempt a differentiation between the types of vascularization, to clarify its meaning as associated with diseases of the cornea, elicit the possible causes, and suggest treatment.

As an introduction, however, it might be well if the anatomy of the cornea is first briefly reviewed in order to grasp a better meaning of its important relationship with the conjunctiva and sclera. Clinically, the cornea may be considered in three layers although there are really four distinct ones (fig. 1). The most superficial includes the epithelium and some anterior bundles of the stroma. They are continuous with the conjunctiva and the episclera and are subject to the same diseases. The greater part of the stroma is continuous with the sclera. The deepest layer includes a few posterior bundles of the stroma, Descemet's membrane and the endothelium which are continuous with the iris and ciliary body and react to the same diseases (fig. 2).

Thus it is apparent that, actually, the superficial layers of the cornea should be considered a part of the conjunctiva which forms a complete lining of the anterior surface of the globe and of the posterior surface of the lids. The deeper layers of the cornea should be considered a part of the sclera, iris, and ciliary body; and the limbus should be thought of as that area where the conjunctiva corneae is converted into the conjunctivae sclerae (fig. 2).

Dr. Magrane was lecturer in ophthalmology in the School of Veterinary Medicine and resident graduate student in ophthalmology in the Graduate School of Medicine, University of Pennsylvania in 1953 to 1954.

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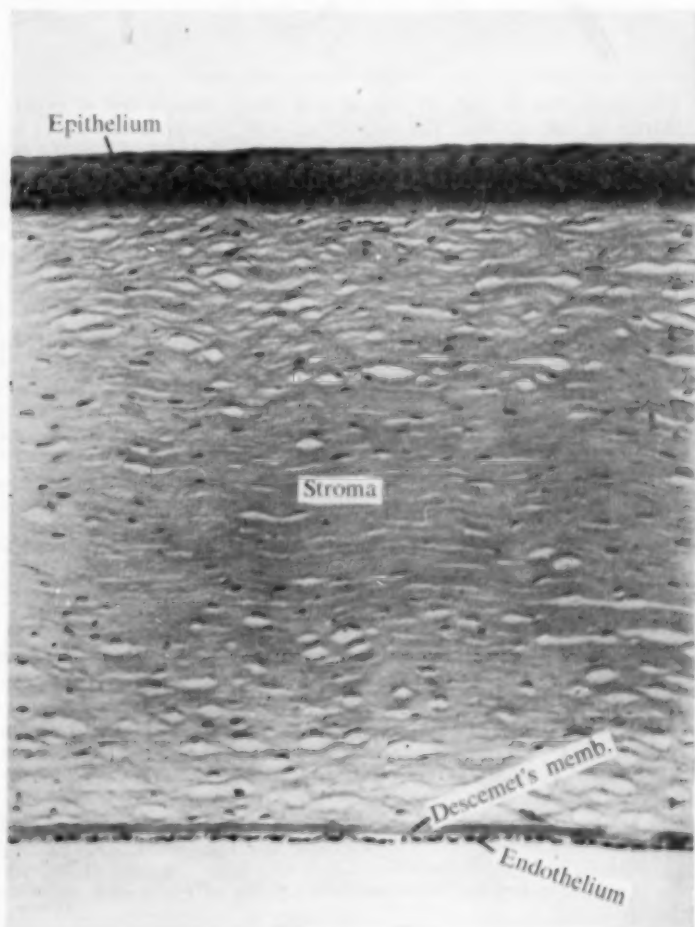
The cornea is an avascular tissue, receiving its nutrition from the perilimbal vessel plexus (fig. 2), but in pathological conditions, in order to increase its defenses against irritants, metabolism is increased; first, by an augmentation of the normal circulation, which is evident clinically as a pericorneal injection; and secondly, by the actual invasion of the cornea itself by new vessels. Pericorneal injection is the invariable accompaniment of inflammatory or irritative processes in the cornea, and is, essentially, the engorgement of the normal perilimbal plexus, which is usually macroscopically invisible.

The new vessels invade the cornea from the limbus at the level of the pathological

process in this tissue, so that the depth at which the vessels are seen may provide valuable information as to the depth at which active changes are occurring in the cornea. Similarly, the site of old vessels indicates the seat of old corneal disease, and the blood vessels never completely disappear. The blood itself will disappear but the vessels remain as "ghost vessels" that are best seen and studied with suitable magnification.

The two types of vascularization are referred to as superficial and deep, and from their appearance in the cornea are easily distinguishable one from the other. The superficial vessels run directly under the epithelium and in the superficial stroma.

Fig. 1—Section showing the four layers of the cornea.



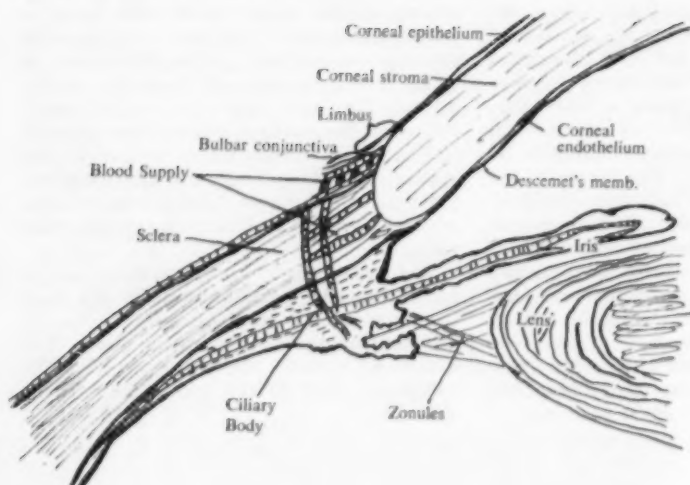


Fig. 2—Schema showing the continuous structure of the corneal epithelium and conjunctiva.

The deep vessels run in the deeper two thirds of the stroma. The superficial vessels are derived from the conjunctival circulation and run across the limbus in direct continuity with the conjunctival vessels (fig. 3). The deep vessels are derived from the deep ciliary vessels and disappear from view at the margin of the cornea as they run into the sclera (fig. 4).

The superficial vessels are a bright red, as opposed to the darker purple of the deep vessels. Most important of all, the superficial vessels branch in treelike fashion (fig. 3), while the deep vessels appear as long, straight lines, or form regular brushlike clumps (fig. 4).

There is considerable difference of opinion regarding the effect of corneal vascularization, whether it is beneficial or harmful. Some authors consider the blood

vessels one of nature's methods of bringing further defensive mechanisms to the cornea to aid in its fight against noxious influences; whereas others consider the presence of the blood vessels only another harmful process which must be eliminated.

The writer is in accord with both opinions, believing that it is Mother Nature's way of helping out, but that a cure of the condition can be brought about in a more desirable manner and without the attending complications of vascularization. For that reason, attempts to destroy vascularization are discouraged.

Briefly, the causes of vascularization of the cornea are: (1) injury and inflammation (traumatic and toxic), (2) infection, (3) nutritional (lack of riboflavin, some amino acids), and (4) allergic reaction.

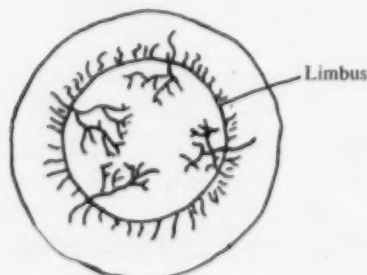


Fig. 3—Superficial vascularization of the cornea.

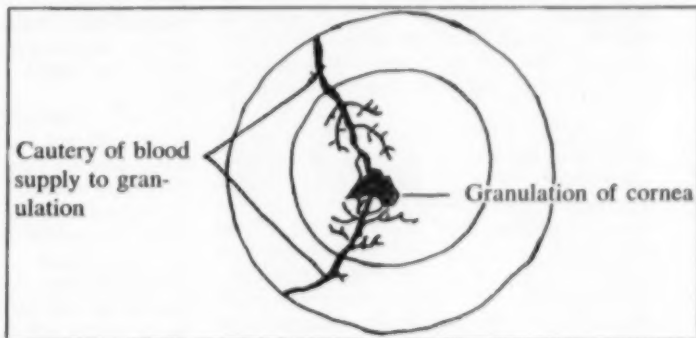


Fig. 4—Deep vascularization of the cornea.

No attempt will be made to enumerate and prescribe for all of the many disease conditions accompanied by either superficial or deep vascularization, nor is it the purpose of this paper to do so. Considering groups as a whole, however, superficial

This diagnosis, however, depends upon a careful inquiry as to the diet and often can be made only after riboflavin has been administered and a dramatic response noted. In any event, riboflavin is indicated in any vascularizing process of the cornea,

Fig. 5—Treatment of granulation of the cornea by means of cautery.



vascularization resulting from injury, e.g., foreign bodies, trichiasis, entropion, and lid neoplasms in contact with the cornea, will leave the scene following the removal of the causative agent or correction of the deformity.

Superficial vascularization as the result of an extension of infection from the conjunctiva into the cornea will respond to the use of antibiotics, in conjunction with cortisone or, better still, hydrocortisone. Hydrocortisone is of real value in any external ocular disease produced by allergens, toxins, irritants, or physical trauma, especially for its inhibition of corneal vascularization.

When, following injury or ulceration, granulation tissue builds up on the cornea and superficial vessels can be seen extending from the conjunctiva, thence across the cornea to that area of granulation, then more involved treatment is required. By means of the process of peritomy the source of blood supply to the granulation areas is destroyed by heat or electrocautery as it arises in the bulbar conjunctiva (fig. 5). Thus, without the support of these vessels, the granulation tissue will disappear and the cornea will regain its transparency.

When a lack of riboflavin is the cause of superficial vascularization, parenteral or oral use of this vitamin in 10- to 25-mg. daily doses will effect a rapid recovery.

with the possible exception of that traumatically induced.

When pannus (subepithelial connective tissue infiltration with accompanying vascularization) invades the cornea, a still more refractory problem exists. Then peritomy, chemical cauterization (e.g., phenol), x ray or beta ray radiation, or superficial corneal surgery must be resorted to in order to stop the process.

Deep vascularization (fig. 4) is an indication of deep-seated trouble and is seen most frequently as an accompaniment of interstitial keratitis. This form is characterized by diffuse cellular infiltration of the stroma and is closely allied with inflammations of the iris and ciliary body (uveal tract). Because of the dense corneal opacity, however, often the iris can not be seen and studied. Short vessels radiate evenly from the limbus toward the center and may escape detection in the early stages of the disease. Later they become more prominent and progress toward the center, but do not necessarily reach the center. The vascularization may confine itself to segments, but more often involves the whole circumference of the cornea.

Since the type of vascularization denotes involvement of the iris and ciliary body, as a result of either focal infections, specific diseases (e.g., distemper and hepatitis), or following wounds; then treatment must be directed to the uveal tract. If

possible, the cause of the uveitis is determined with an attempt to eliminate it. In addition, the local use of atropine several times a day is of utmost importance. Hydrocortisone and foreign protein are used in conjunction with the atropine. Occasionally, radiation therapy must be utilized as an adjunct. When the condition is of a chronic nature and involvement of the posterior segment of the globe is suspected, hydrocortisone must be used systemically as well.

Briefly, hydrocortisone may be used locally as either the suspension, in ophthalmic ointment form, or up to 12 mg. injected subconjunctivally every second day. The drops should be used every hour the first day, tapering off so that instillations are made four to six times a day. The ointment is efficacious when used every eight hours. When systemic administration is required, 40 to 60 mg. a day in divided oral doses will most often suffice.

Foreign proteins include a choice of sterile milk, concentrated omnadin® and typhoid vaccine. All are repeated at 48-hour intervals. If typhoid (typhoid h antigen) is to be used, a recommended schedule, is: 25,000,000 bacteria intravenously for the first administration, rest a day; 40,000,000 for the second administration, rest a day; and 60,000,000 for the third and final dose.

SUMMARY

Most diseases of the cornea result in its vascularization, and the type of vessels and their location in the cornea is often a clue to the nature of the disease process. The diseases which commonly affect the epithelial structures are accompanied by superficial vascularization, the vessels coming across the limbus from the conjunctiva. Those diseases affecting parenchymatous tissue (stroma), on the other hand, are characterized by deep vessels. Vascularization is nature's method of bringing further defensive mechanisms to the cornea to aid in its fight against noxious influences. Because of the attending complications of this phenomena, vascularization is discouraged and attempts are made to correct the disturbances in a more desirable manner. Treatment is suggested for the varied superficial and deep types.

A Case of Tetanus in a Dog

FRED L. NEWBURY, D.V.M.

Berwyn, Illinois

A 4-month-old, 35-lb., male German Shepherd puppy was presented on Oct. 10, 1954. He had been walking with a stiff gait and eating with difficulty for several days but now was unable to move without assistance.

When examined, he could no longer stand, but his temperature and respiration were normal. There was a definite increase in reflex excitability but the position of the membrana nictitans was normal. However, the pupils of the eyes were constricted. The head and neck were stiff and drawn slightly backward, and the skin of the head was furrowed in such a manner as to bring the anterior edges of the ears into apposition. The lips were drawn back in a typical sardonic grin. The limbs and tail were distended and stiff and it was impossible to bend the limbs manually. The animal exhibited complete trismus but was able to move the tongue. A diagnosis of tetanus was made.

Treatment the first day consisted of 1.0 cc. of curare (20 units/cc.) in 9.0 cc. of physiological saline solution, administered intravenously at the rate of approximately 2.5 cc. per minute; 40,000 units of tetanus antitoxin added to 250 cc. of aminosol,* intravenously at the rate of approximately 50 cc. per hour; and 600,000 units of aqueous penicillin, intramuscularly.

A puncture-type wound, finally located under the pad of the right rear foot, was curetted and cleansed.

Since the pup had not been vaccinated against distemper and infectious hepatitis, he was given antiserum at the rate of 1.0 cc. per lb. of body weight.

Treatment on the second day was essentially the same, except that the dose of tetanus antitoxin was reduced to 10,000 units.

On the third day, the tetanus antitoxin was reduced to 5,000 units, and the daily dosage of penicillin was reduced to 300,000 units. This therapy was maintained daily for the remaining eleven days the pup stayed in the hospital.

Dr. Newbury is a member of the staff of the Berwyn Animal Hospital, Berwyn, Ill.

*Abbott Laboratories, North Chicago, Ill.

On the sixth day, with the rigidity of the muscles diminished and the pup able to drink fluids when given slowly through the side of the mouth with a dose syringe, the administration of curare was stopped. A thin gruel, prepared from ground meat, was fed five times daily until the eleventh day when he could eat by lapping the gruel from a pan.

On the twelfth day, the dog pushed himself to a sitting position and wagged his tail vigorously, and on the fourteenth day, when he could walk out of his cage without assistance, he was sent home.

Eight days later, he was returned with a temperature of 104 F. and a poor appetite. He responded rapidly to antibiotic and supportive therapy.

He was slightly stiff in all limbs for about six weeks but now is completely normal.

Granular Cell Myoblastoma in a Dog

MATTHEW A. TROY, D.V.M.

Pelham, New York

Olafson¹ states that primary tumors of the muscles in animals are rare. In his enumeration of those that do occur, he does not mention myoblastoma. Boyd² states that in man primary tumors of the striated muscle are remarkably rare.

On Oct. 19, 1953, a 5-year-old, male hound was presented for examination. On the right side of his thorax, about 10 cm. behind the scapula, a bulge about 2.5 cm. in diameter was apparent under the skin. The owner reported that in the past three weeks it had increased noticeably in size. The neoplasm and adherent skin were excised and sent to the Armed Forces Institute of Pathology. Their report follows:³

Gross.—The specimen consists of a circular portion of skin containing a nodule 1.5 cm. in the greatest diameter. The cut surface of this nodule is dense and white.

Microscopic.—This new growth consists of oval to elongated cells with oval vesicular nuclei and pale granular cytoplasm. Many of these cells have giant nuclei and a large eosinophilic nucleolus or "inclusion" surrounded by a halo. Columns of these cells are packed between collagen fibers (fig. 1). A circular yellow structure the diameter of a hair follicle is found



A.F.I.P. Acc. 615712

Fig. 1.—Section of a myoblastoma from the skin of a dog showing bands of collagen fibers (A) and cells packed between them. Hematoxylin and eosin stain, $\times 650$.

embedded in the upper layer of the dermis. This structure is composed of many polyhedral-shaped cells with heavy cell walls and brown centers. This object is interpreted to be plant material.

Diagnosis.—Granular cell myoblastoma, skin, canine.

Comment.—A neoplasm of this type has not been reported in animals in so far as we know. . . . The significance of this neoplasm is not known.

Discussion.—This canine tumor has the same structure histologically as the myoblastoma found in man. Boyd² says that in man the tumor is malignant and the skin is one of the common sites.

This dog runs freely in tall grasses and it is possible that some plant material could have become embedded in his skin. To date, there is no evidence of metastasis.

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Geese can fly at 60 miles an hour and hold the bird altitude record of nearly 5½ miles. —*Sci. News Letter*, Jan. 22, 1955.

Dr. Troy is a small animal practitioner in Pelham, N.Y.

³The examination and report were made by Lt. Col. T. C. Jones, V. C., U. S. Army.

The Absorption of Sulfamethazine by the Bovine Uterus

C. J. BIERSCHWAL, D.V.M.; H. E. DALE, D.V.M., Ph.D.;
A. W. UREN, D.V.M., M.S.

Columbia, Missouri

DRUGS INTRODUCED into the bovine reproductive tract are intended, almost without exception, for local action on the endometrium. There is, however, the distinct possibility that such agents will be absorbed and that they will exert a systemic effect in addition to the desired local effect. The possibility that sulfonamides might be absorbed from the bovine uterus was suggested by the observation that such solutions were present twenty-four hours after injection, but disappeared from the uterus by forty-eight hours without noticeable vaginal discharge.

Although veterinarians usually ignore the potentialities of the reproductive tract as an organ of absorption, the process has been extensively studied in experimental animals and in man. Macht^{1,2} has shown that the dog, cat, and rabbit can absorb a wide variety of drugs from the vagina, including apomorphine, morphine, pilocarpine, atropine, cocaine, aconitin, potassium iodide, potassium ferrocyanide, potassium cyanide, nitroglycerine, phenol, cresol, mercuric bichloride, quinine, and oxyquinolin. All of these are absorbed from the vagina in quantities sufficient to produce systemic effects. Robinson³ failed to find evidence that Witte's peptone or secretin were absorbed from the vagina of the dog; however, this author did demonstrate the vaginal absorption of strychnine, pituitary extract, and insulin. It has been demonstrated that the human vagina can absorb potassium iodide, sodium salicylate, quinine, cane sugar, and phenol red.³ Macht¹ cites extensive literature describing systemic human intoxications resulting from the vaginal absorption of arsenic, belladonna, zinc sulfate, iodoform, phenol, and mercuric bichloride.

Rosenzweig and Walzer⁴ used an immunological method to detect the absorption of unaltered peanut protein from the human

reproductive tract. The protein was detected from cervical absorption within eight to twenty-five minutes after application; absorption from the vagina was detected within forty to 120 minutes. In the human female, DeLee⁵ states that over 50 cases of bichloride poisoning and as many more of carbolic acid poisoning resulted from the chemicals being absorbed by the uterus or gaining entrance to the blood through the sinuses.

A search of the literature revealed no controlled studies on the absorption of drugs by the bovine uterus.

PROCEDURE

The 4 Jersey cows used in this study had a uniform history. Each had completed one gestation period and had subsequently been culled for low production. At the time of observation, they were approximately 4 years old, nonpregnant, nonlactating and, as nearly as could be determined by rectal examination, in the diestrous phase of their cycle.

As a sterile 25 per cent solution, 250 ml. of sodium sulfamethazine⁶ was administered to each animal. The drug was introduced with a Chamber's uterine catheter and was equally divided between the two uterine horns. Jugular blood samples were taken before injection and $\frac{1}{2}$, 1, $1\frac{1}{2}$, 2, 4, 6, 12, and 24 hours after injection. All samples were analyzed for total sulfonamide by the method of Bratton and Marshall.⁶

RESULTS AND DISCUSSION

Figure 1 shows blood concentrations following the intrauterine administration of sulfamethazine. The preinjection sample was regarded as a blank and its value was subtracted from each subsequent determination.

Blood concentrations showed a similar pattern in 3 of the 4 animals. The high value was reached approximately two hours after administration. Therapeutic concentrations were maintained for more than twelve hours, and the drug was present in measurable quantities twenty-four hours after administration. It would appear that sulfamethazine is absorbed more rapidly from the uterus of the cow than it is from the gastrointestinal tract of the calf and

⁶This is approximately 1.5 gr./lb. of body weight.

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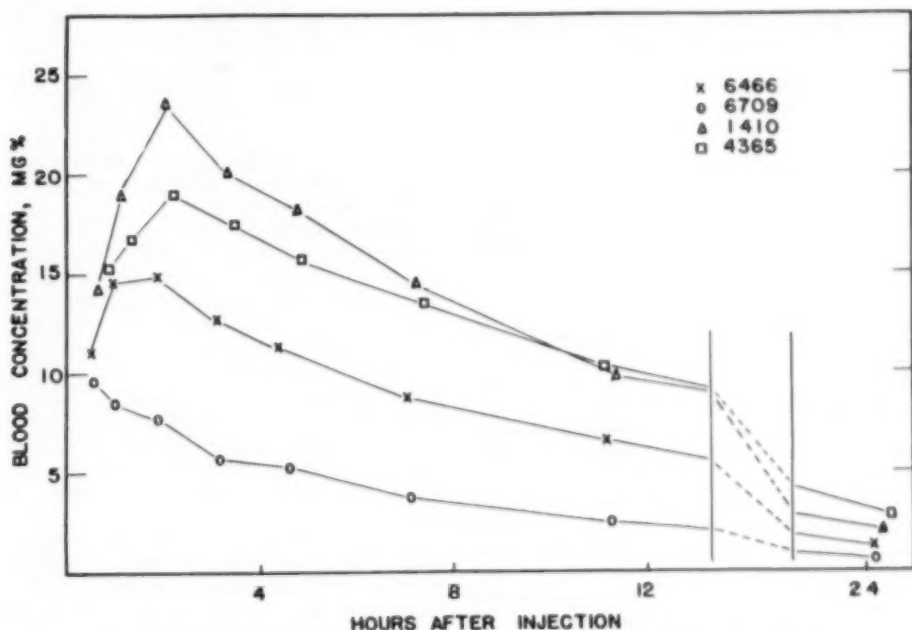


Fig. 1—Blood concentrations following the intrauterine administration of sulfamethazine.

that effective blood concentrations are maintained about as long after intrauterine administration as they are after intra-venous administration.⁷

The 1 animal (6709) that did not exhibit the same pattern of blood concentrations may have forced some of the solution back into the vagina. In all of the animals, the intrauterine injection of this quantity of fluid caused some discomfort and this was associated with contractions of the myometrium.

Other drugs, including antibiotics, may be absorbed equally well from the endometrium and their systemic effect will have to be taken into consideration when they are administered intrauterine.

SUMMARY

Therapeutic amounts of sulfamethazine were found to be rapidly absorbed from the diestrous bovine uterus.

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Pasture Management for Worm Control.
—Strip grazing for the control of internal parasites in sheep is recommended. Since three days is the time required for ovine nematode eggs to develop into infected larvae, the fencing should be moved so that a fresh strip of pasture is available every two days. Sheep should not be returned to that area until the next year. The use of this method for two years should free the sheep of these parasites.—*Vet. Bull., Dec., 1954.*

Roentgen Diagnosis and the Dangers to Personnel

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Because of the importance of x-ray diagnosis, as well as x-ray therapy, to veterinarians, I should like to mention some of the dangers it entails and to suggest some solution to such problems. As general practitioners in the truest sense of the word, veterinarians are not specialists in the field of radiology. Yet they need radiology in diagnosis more, perhaps, than the human practitioner who can usually obtain a history from his patient.

Many advances in all fields of medical science can be directly attributed to the application of roentgen diagnosis. Chest diseases and systemic diseases reflected by pulmonary changes can now be classified, and their progress and healing followed, more satisfactorily by x ray than by any other diagnostic means. The use of abdominal films and the introduction of barium have provided a detection method far greater in its scope and leading to a broader understanding of the gastrointestinal tract than any previous studies. Barium clysis by gastric or by rectal tube serves as an aid in the localization of obstructive lesions, foreign bodies, tumors, and other distorting abnormalities. The use of intravenous dyes to study kidney and urinary tract abnormalities and localized tumors and stones is at our service. These are just a few examples of how x-ray diagnosis may be applied from the teeth to the tip of the tail as it were.

The essentials of good radiography are easily summarized but not easily obtained; nor are they unobtainable. A good film is, of course, the basis of good diagnostic roentgenology. This requires equipment capable of producing x rays of a quality and quantity sufficient to yield the results desired as well as the ability to produce them. Good films are not an accident nor is a good machine a guarantee of results.

When a good film has been obtained a qualified radiologist can be a great help in interpreting a veterinarian's problem

cases. At least, he might explain variations and densities and try to correlate them with experience in human patients.

There probably is no greater folly than the abuse of laboratory procedures or to expect more of the method than it can provide. Thus to diagnose the presence of a noncalcified brain tumor in an intact skull is an impossibility.

Inherent Dangers in the Use of X Ray.—

It should be stated at the outset that properly installed, adequately protected equipment wisely used need not be dangerous. However, roentgen rays for diagnosis (films and fluoroscopy) are safe only because radiologists have a long tradition of being careful and because films and screens are so sensitive as to require rather small exposures. The greatest hazard, by actual statistical study, is encountered in surgeons and general practitioners who set bones or locate foreign bodies by fluoroscopy. Paradoxically, the smaller types of x-ray machines have provided the worst cases of x-ray ulceration and skin or systemic damage. Excessive use, prolonged exposure, and carelessness are, of course, at fault.

In 1931, the Advisory Committee on X-Ray and Radium Protection placed the tolerance dose at 0.2 r per day. By 1936, it was cut in half and, in 1950 and 1953, the International Commission on Radiological Protection advised a maximum of 0.3 r a week. Now atomic energy workers are permitted an aggregate exposure of 15.0 to 30.0 r per year. A recent report of a survey in New Jersey indicated that 53 out of 63 fluoroscopes operated in the offices of nonspecialists gave off more than 10.0 r per minute and one half of them produced 20.0 r per minute. Of course, we do not stand unprotected before a fluoroscopic beam, but if we should do so we could incur in one minute the radiation considered permissible in one year. Therefore, a lead apron and lead gloves must be worn whenever the fluoroscope is used. Also, vision should be accommodated long enough to enable one to see immediately what is going on and thus shorten the total amount of fluoroscopy. The distance of the tube from the table and thus from the operator must be checked and moved back if too close. A 2-mm. aluminum sheet over the tube opening should be added since it filters out useless but damaging rays. There is

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no need to expose the hands to manipulate a fracture under fluoroscopic control. One can learn to adjust the bone elements with the machine turned off and then check while the hands are out of the field of exposure. This method must be used properly and safely to avoid skin changes, anemia, leukemia or leukopenia, which are the penalties. For those who wish to know more, it might pay to obtain, from the General Electric X-Ray Corporation, a statistical and straight-forward discussion in very readily understandable terms entitled "What You Should Know About X-Ray Protection." It is available in pamphlet form.

Interpretation of Film.—Having safely produced a proper diagnostic film with the help of a good machine and a capable technician and processed it properly, it is ready for interpretation. With or without the help of a radiologist, the basic problem is to estimate the variation from the broad spectrum of the normal. There is no substitute here for experience nor for the application of sound common sense and clinical data and the contemplative scientific curiosity that the trained mind may use only if it is cognizant of all possibilities.

Conclusions.—The manufacturers have done an excellent job in making modern equipment which is electrically safe, and the best possible job in making it safe from the point of view of radiation, but no one yet has built a machine that is fool-proof. In this, as in any other work, there is no substitute for common sense. The use of diagnostic radiology in the practice of the healing arts needs no articulate proponents; it is a proved weapon. Use it properly, apply it wisely and safely, and the practitioner as well as his patrons will profit.

A Combination Coccidiosis Vaccine

Feeding a combination of cecal and intestinal varieties of coccidia to chicks 3 days old, followed thirteen days later with a mild dose of sulfaquinoxaline in the drinking water, is reported to be successful in preventing clinical infection. The Alabama School of Agriculture at Auburn has thus expanded the method it introduced two years ago for the protection against cecal coccidiosis only.—*World's Poult. Sci. J.*, Jan., 1955.

Sodium Nitrite Poisoning in Pigs

When a mixture of "swill" from two sources was fed to 44 shoats, 30 were dead in forty-five minutes, 37 in eighty minutes, and all but 1 in four hours. They vomited, squealed, and showed respiratory distress. The only lesion was congestion of the fundic zone of the stomach. Three hens which ate the food also died.

Analysis of the feed mixture, which had an odor of burning phosphorus due to the release of nitrous acid, revealed that it contained 1.25 per cent sodium nitrite which is used in pickling salts and brine.—*Irish Vet. J.*, Jan., 1955.

The Sheep Scabies Symposium

Sheep scabies which has required active control in the United States for over sixty years has, for many years, been considered as present only in a few counties of Mississippi and Louisiana. In the past fiscal year, however, it was diagnosed in over 400 flocks involving 40,000 sheep in 21 states. Because of this, more than 50 livestock sanitary officials representing 27 states met in Chicago on March 1 to discuss the problem. It was recommended that nicotine sulfate solution no longer be used for dipping. The preferred dip is a 0.06 per cent gamma BHC or lindane solution. For sheep, a single dipping is effective since mites which hatch later are destroyed by the agent in the wool. For range in cattle, a stronger solution (0.075 %) and two dippings ten to twelve days apart are required.—*U.S.D.A.*, March 11, 1955.

Therapy for Foot Rot in Sheep

A single brush application of a chloromycetin® solution (10%) in methylated alcohol was effective in 80 per cent of ovine foot rot cases when the affected foot was well trimmed and the animal kept on a clean floor for at least an hour after treatment. Trimming and treatment should be repeated, if indicated, after two weeks. A formalin solution (10%) was also effective when repeated four times at weekly intervals. Since sodium arsenite solutions are toxic when absorbed or accidentally ingested and, since copper sulfate solution may be toxic and deteriorates with use, these treatments are no longer recommended.—*J. Dept. Agric. South Australia*, Dec., 1954.

Avian Infectious Hepatitis—A Preliminary Report

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THIS PRELIMINARY report concerns a disease of chickens observed at this laboratory* which appeared as a flock problem about the middle of October, 1954. Apparently, in the past, a similar condition has been observed by many workers but it has been represented only as an individual bird problem. Possibly it has been diagnosed most often as visceral lymphomatosis, ascites, hepatitis, or just "mismanagement."

This is a report on the condition as seen in 15 laying flocks, one group of 300, 5-month-old White Rock cockerels, two fryer flocks, and two flocks of replacement pullets. The specimens necropsied did not show any significant gross or microscopic hemorrhages or necrotic areas of the liver; therefore, this disease differs from the liver degeneration of chickens described by Tudor.²

HISTORY

Avian infectious hepatitis appeared in the area abruptly, affecting eight separate flocks within a period of three weeks. Because they were all on the same feed, an all-purpose laying mash supplied by the same company, it was tentatively assumed that the feed was at fault. Laboratory analyses indicated, however, that there was no discrepancy in the nutritional composition and no evidence of any foreign substance which could account for the disease. Additional outbreaks also occurred in flocks that were on other feed supplied by different companies.

All of the eight flocks were maintained on litter, except that a few growers also had birds on wire, and these birds were not affected. At least eight different hatcheries supplied the chicks for these flocks.

ETIOLOGY

A pleomorphic coccoid organism has been constantly isolated from the liver and spleen of the specimens necropsied.

The organism required enrichment substances such as bacto PPLO serum fraction or chicken whole blood for growth. Bacto

blood agar base containing 5 per cent chicken whole blood and 1:2,000 thallium acetate and bacto PPLO broth with 1 per cent bacto serum fraction added was used for primary isolation. The growth on the blood plates was abundant, confluent, and produced *alpha* (viridins) hemolysis. Optimum growth in bacto PPLO broth at 37 C. was obtained after forty-eight hours' incubation. Abundant growth was obtained in brain-heart infusion broth with 20 per cent avian serum.

The organism is gram-negative, nonmotile, and presents an extremely pleomorphic coccoid form. The shape varies from globular to a filamentous branching body. It often appears to have a yeastlike morphology with many spheroid forms exhibiting budding-like protrusion. The size varies from less than 0.5 μ in diameter to greater than 10.0 μ . Stained preparations from smears of the confluent growth from blood-agar plates demonstrated amorphous masses in which it was difficult to distinguish a defined morphology.

The organism consistently killed 5- to 6-day-old chicken embryos within forty-eight hours. In embryos older than 9 days, the incubation period varied from one to eight days and they survived until they were opened for examination. The allantoic sac and yolk sac were sites of choice for instilling the infective agent. Grossly, the dead 5- to 6-day-old embryos were hemorrhagic and the 9-day or older embryos showed viscidules of varying size in the enveloping membranes. Smears of the allantoic fluid demonstrated masses of the globular-shaped organism and the cultures were positive for the agent. This agent, when inoculated intravenously into test chickens, consistently produced an acute nonsuppurative hepatitis within three weeks and the organism was reisolated from the livers of the test birds.

CLINICAL OBSERVATIONS

In laying flocks, the disease was characterized by the simultaneous appearance of a number of culls and a drop in egg production. The birds continued to eat normally

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without an increase in mortality. Within ten days after the apparent onset, the daily cull rate sometimes reached 2 to 3 per cent. The egg production dropped 20 to 30 per cent within two to three weeks and remained at the low point for about two weeks and then steadily climbed back to a normal range in two to four weeks. The morbidity rate varied but averaged about 20 per cent. The affected birds became emaciated within three to four days after the first signs were noticed. In the older laying birds, a partial molt occurred.

A few birds in the laying flock progressed from a listless appearance to a moribund condition in three to four days, then remained moribund for three to five days. They attempted to eat until they were comatose. Others did a "fade out" and had pale shrunken combs, but many of these recovered and resumed egg production in five to eight weeks. There were no signs of any respiratory involvement during the course of the disease.

The birds in the cockerel flock demonstrated a peracute syndrome, with deaths occurring within twenty-four hours. Marked depression and cyanosis developed, with the combs and wattles becoming dark red or purple. The mortality was 10 per cent within forty-eight hours.

In the other nonlaying flocks, the disease involved individual birds and could have been overlooked because of its sporadic nature. The growth of the birds may have been retarded in some flocks. The affected bird sometimes appeared listless but did not present the ruffled "sleepy" picture which typifies coccidiosis. Slight leg weakness was associated with this disease in the fryer and replacement pullet flocks.

The clinical and pathological findings indicated that avian infectious hepatitis may show a peracute, acute, or chronic syndrome.

PATHOLOGICAL FINDINGS

Gross Pathology in Laying Hens.—The combs and wattles were pale, shrunken, and the tips were cyanotic. The carcass was usually extremely emaciated and the flesh was pale. The most characteristic change was in the liver which was enlarged to various degrees and ranged from soft and exceedingly friable to a dense cirrhotic consistency (fig. 1). The friable type presented a gradient from a smooth to a mot-

tled, coarse, granular surface. The cut surface of the liver in the early stages of the disease appeared to have uniform areas of yellowish brown mottling, especially at the tips of the lobes. The granular areas were usually some shade of green with speckles of bronze, dull red, and purple. The livers varied from shades of red, green, and purple to bronze and chocolate, many showing all of these shades. Other individual lobes showed only one color. Ascites was usually absent in the specimens with a friable liver. The cirrhotic livers were usually of a dull gray tone and somewhat enlarged, with rounded edges, and associated with an ascites which did not extend into the abdominal air sacs. Some specimens had as much as 750 ml. of ascitic fluid.

The spleens were slightly enlarged and had a dull purple tone. The kidneys were enlarged and were pale blue-gray in the birds with the cirrhotic livers, and dark red to purple in specimens with friable livers.

Gross Pathology in Cockerels.—The combs and wattles of the cockerels were cyanotic. As a result of their more acute illness, they were in good flesh but their musculature was dehydrated and had a purple hue. The livers were soft, enlarged, and dark purple to blackish. The spleens were one half larger than normal and the cut surfaces bulged. The kidneys were soft, enlarged, purple, and the convolutions were indistinct.

Histopathology.—In the peracute and

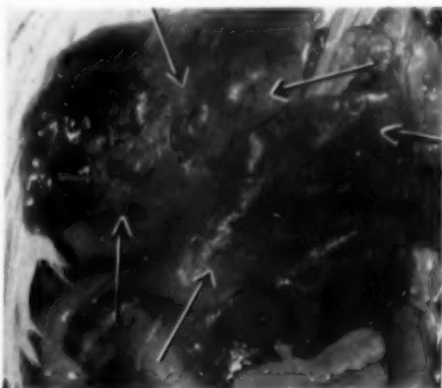


Fig. 1.—Liver of a chicken with chronic nonsuppurative hepatitis, showing gross lesions of cirrhosis (arrows).

acute cases, the livers showed acute non-suppurative hepatitis characterized by lymphoid infiltration and connective tissue proliferation, which surrounded the hepatic blood vessels and bile ducts, extending into the adjacent parenchymal region. The hepatic cells radiating from these areas showed fatty degeneration and the sinusoids as well as the blood vessels were congested with red blood cells. In some sections, there was evidence of bile stasis.

The enlarged, coarse, granular, friable livers and the cirrhotic livers were classified as chronic nonsuppurative hepatitis (fig. 2 and 3). Some sections showed areas of lymphoid infiltration and fatty degeneration; other areas showed interstitial and parenchymal connective tissue proliferation. Many of the hepatic cells adjacent to the involved area appeared to have a vacuolated cytoplasm. The connective tissue proliferation was confined to the interstitial substance surrounding the hepatic vessels and bile ducts or it extended into the parenchymal tissue until it was difficult to recognize a functional hepatic cell. The liver lobules of the enlarged, icteric, friable livers were separated by large areas of loosely arranged connective tissue cells which sur-

rounded small, irregular-shaped masses of a homogeneous pink-staining material suggestive of hyaline degeneration.

The tissue sections were stained by the buffered azure eosinate method as described by Lille¹ and with hematoxylin (Harris) and eosin stain.

DIAGNOSIS

A positive diagnosis of avian infectious hepatitis depends on the isolation of the causative agent and the histopathological findings in the liver.

The most common form, the subacute to chronic form, as it occurred in the laying flocks, can be recognized by:

- 1) A drop of 20 to 30 per cent in egg production within two to three weeks.
- 2) An increase in affected birds to 10 to 50 per cent in three to four weeks.
- 3) Many affected birds rapidly becoming emaciated, necessitating a daily culling program. At the onset of the outbreak, up to 5 per cent of the birds may become affected daily without a marked increase in the mortality.
- 4) The feed consumption remains about normal.
- 5) The disease apparently runs its course in five to seven weeks after which the survivors resume normal egg production.
- 6) Necropsies reveal a gradient degree of hep-

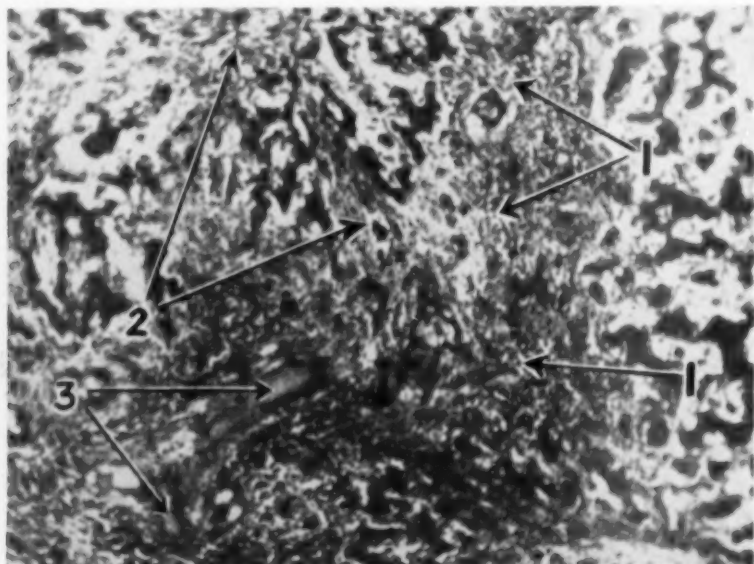


Fig. 2.—Photomicrograph of a section of a friable liver demonstrating chronic nonsuppurative hepatitis and showing: (1) lymphoid infiltration; (2) connective tissue proliferation; and (3) hyaline casts. Hematoxylin-eosin stain, $\times 110$.

atitis from a soft congested liver to the dull gray cirrhotic liver. The cut surface of the soft congested liver presents areas of yellowish brown mottling.

Peracute and acute outbreaks, such as occurred in the cockerel flock, are characterized by:

- 1) Sudden death of the affected bird or, in the acute form, the sudden appearance of a high percentage of affected birds which either progress to a moribund condition and death within four to seven days, or to complete recovery.
- 2) The flock apparently continues to eat normally.
- 3) Necropsy findings in the peracute cases reveal an enlarged, soft, congested liver and an enlarged, purple spleen. The comb and wattles are cyanotic and the flesh is dry and has a purple discoloration.

ATTEMPTED CONTROL MEASURES

The intramuscular injection of 50 mg. of dihydrostreptomycin sulfate per pound of body weight appears to be the most effective method of controlling the peracute and acute forms of the disease. If the flock is treated at the onset of the outbreak, the progress of the disease is arrested and the flock returns to normal within ten days.

Apparently high levels of antibiotics in the feed or the use of the soluble form of

these antibiotics does not alter the course of the disease.

In the laying flock, the supplemental feeding of cane molasses, as a supportive measure, is beneficial during the early stages of the disease. One pint of molasses mixed in 4 to 5 gallons of drinking water for four to five days appears to be of some value.

DISCUSSION

Avian infectious hepatitis as a flock problem is new to this area (Turlock) of California. Many laboratory workers report they have seen specimens with identical liver changes but it has always been an individual bird problem.

With one exception, the outbreaks in laying flocks were not associated with any previous history of a disease. Twelve of the 15 flocks were on a 16 to 18 per cent crude protein ration, with less than 7 per cent crude fiber. A controlled experiment has been set up to determine whether the type of ration is a predisposing factor. All of the severe outbreaks were in flocks maintained on litter.

This disease may occur in a peracute, acute, or chronic form. The peracute form was observed in the cockerel flock only. The chronic form represented by the cirrhotic liver has not been observed in nonlaying

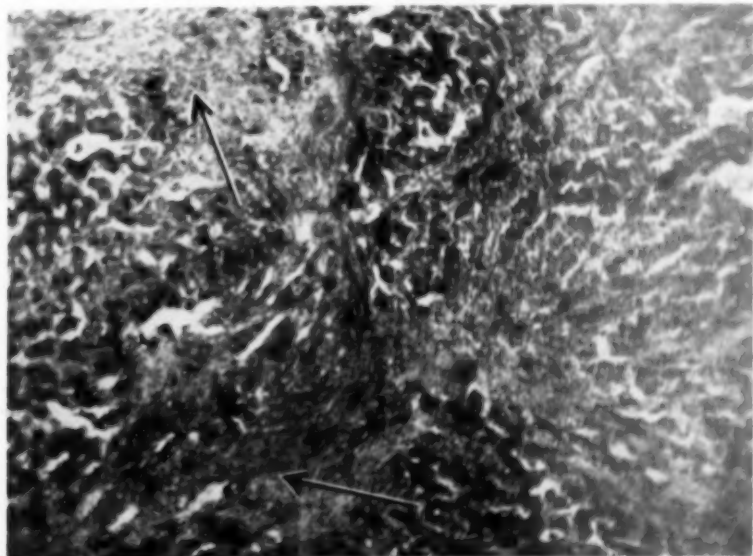


Fig. 3—Photomicrograph of a cirrhotic liver demonstrating chronic nonsuppurative hepatitis and showing areas of cirrhosis (arrows). Hematoxylin-eosin stain, $\times 110$.

pullets and cockerels. Apparently this disease may not be noticed in the early stage unless the operator is alert.

SUMMARY

1) This report describes avian infectious hepatitis which is new to this area (Turlock) of California as a flock problem.

2) The etiological agent is a fastidious, pleomorphic, gram-negative, coccoid to yeastlike organism.

3) In laying flocks, the disease was characterized by a drop of 20 to 30 per cent in egg production within two to three weeks and it subsided as a flock problem in about eight weeks. The disease was peracute in the cockerel flock. In the nonlaying pullet flocks, the disease caused a significant growth retardment. In none of the outbreaks was there a significant drop in feed consumption during the entire course of the disease.

4) Microscopically, the infections in the livers were classified as acute or chronic nonsuppurative hepatitis.

5) Dihydrostreptomycin sulfate, 50 mg. per pound of body weight injected intramuscularly, was apparently effective in controlling the acute and peracute outbreaks.

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A Fatal Case of Amebiasis with Liver Abscesses and Ulcerative Colitis in a Chimpanzee

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In several areas of the world, *Endamoeba histolytica* (*Amoeba dysenteriae*) is important as the etiological agent for liver abscesses. To date, as far as the authors can ascertain, no such case has been reported in a chimpanzee. This paper presents a case history of a chimpanzee which

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This paper was presented at the conference of Zoo Veterinarians held during the Seattle convention of the AVMA, Aug. 23-26, 1954.

expired from liver abscesses and ulcerative colitis caused by *E. histolytica*.

CASE HISTORY

A 3-year-old male chimpanzee had arrived at the Radiobiological Laboratory of the University of Texas and the U. S. Air Force from an animal dealer in New York eight months prior to his death. At the time of arrival, the animal was examined and appeared to be free from respiratory and intestinal ailments. Shortly afterward he contracted an upper respiratory infection which subsided after three days of penicillin therapy, 300,000 units per day intramuscularly.

One month later, he again contracted an upper respiratory infection which subsided without therapy. The following month, a chest radiograph and intrapalpebral tuberculin test with 0.1 ml. of a 1:10 dilution of old tuberculin showed the animal to be normal. However, as he had apparently developed a chronic respiratory infection with a resultant loss of weight, it was considered that he might be tuberculous.

Four months prior to death, when he weighed 10.9 kg., he was again normal when radiographed and tuberculin tested. During the third month prior to death, he developed a recurrent diarrhea accompanied by a decline in activity. At this time, trophozoites of *E. histolytica* were first identified by fecal examination, and the animal was placed on fumagillin therapy, 20 mg. per os twice daily for fourteen days. Seven days after the institution of therapy, he had a bloody diarrhea and was placed on additional therapy, per os: 250 mg. of terramycin® daily for four days, 24 gr. of triple sulfonamides with 20 ml. of bismuth-kaolin-pectate compound daily for seven days, 500 mg. of chloroquine diphosphate daily for fourteen days, and 5 ml. of elixir of nembutal® for three days. During this twenty-one day course of therapy, a fecal examination revealed hookworm eggs.

At the completion of the fumagillin therapy, the animal again had a bloody stool and was inactive for two days. He then appeared to recover gradually until the termination of the chloroquine diphosphate therapy, at which time a decline in activity was again observed. He then was given another fourteen-day course of fumagillin therapy. Two days following the second course of fumagillin therapy, when the animal's temperature was higher than

normal, it was given 250 mg. of terramycin *per os* for four days. This resulted in a slight improvement and the temperature returned to normal. Two days later, when he was found prostrate and in shock, he was given 1 ml. of 1:10,000 adrenalin and 1 ml. of metrazol® intramuscularly, without benefit. A physical examination then revealed a hard mass in the upper right quadrant of the abdomen. The chimpanzee died during examination.

POSTMORTEM EXAMINATION

Liver.—The liver was markedly enlarged, weighing 859 Gm. compared with a normal weight of 350 Gm. The parenchyma contained a multitude of discrete abscesses, measuring up to 8 cm. in diameter (fig. 1), each formed centrally of light, creamy yellow grumose material, and peripherally of a poorly defined soft, gray capsule measuring 1 to 2 cm. thick. Several large abscesses were situated beneath the capsule, imparting a coarse nodular contour to the organ. The parenchyma, even at a distance from the abscesses, was soft and pale, and the normal gross architectural markings were obliterated.

Intestine.—Loops of the small bowel and colon were bound to one another and to the abdominal wall by firm fibrous adhesions. Lesions of the intestinal tract were confined to the large intestine, being present in moderate number within the cecum and with increasing frequency throughout the colon and rectum. Most of the lesions appeared as discrete sessile elevations formed of necrotic, dusky yellow tissue (fig. 2). The necrotic tissue was absent from some of the lesions, leaving sharply defined areas of ulceration which measured up to 3 cm. in diameter. The mucosa around the ulcers was hyperplastic and the muscle beneath them was markedly indurated.

Microscopic examination of the colon confirmed the presence of numerous well-defined ulcers, covered in part by a thick fibrinopurulent exudate. Numerous *E. histolytica* organisms, in trophozoite form, were present within the exudate and also within the granulomatous tissue that formed the basis of the ulcers. The organisms were characterized by the presence of one or two small nuclei and numerous phagocytized erythrocytes within the cytoplasm. Endamoeba were present, as well as within the granulomatous tissue that formed the capsules of the hepatic ab-



Fig. 1—Abscesses in the upper portion of the liver of a chimpanzee with amebiasis.

scesses. They could not be identified in the central areas of liquefaction.

DISCUSSION

Amebiasis has been diagnosed in a number of chimpanzees at the Radiobiological Laboratory, especially in newly received animals.



Fig. 2—Portion of colon of a chimpanzee with amebiasis showing discrete elevations of necrotic tissue.

Stringent sanitation, early diagnosis, and immediate treatment greatly reduce the infection. The usual treatment is a course of emetine hydrochloride, 1 mg. per kilogram of body weight intramuscularly, and not in excess of 60 mg. per day for six days. Following this, fumagillin is given—30 to 60 mg. in divided doses *per os* three times daily for ten to fourteen days. This therapy is repeated as indicated.

The occurrence of the liver abscess in this animal was unsuspected and is believed to have been of relatively long duration. As a result of this case, our examinations now include a radiograph of the liver, as described in man by Ochsner and DeBakey.¹

¹Ochsner, O., and DeBakey, M.: Amebic Hepatitis and Hepatic Abscess. *Surgery*, 13, (March, 1943): 460-493; and (April, 1943): 612-649.

Bacitracin Therapy for Navel Ill in a Colt

HAROLD M. S. SMITH, V.M.D.

Hanover, New Jersey

On April 7, 1954, an apparently normal colt was born to a valuable Thoroughbred mare. Following parturition, its navel was well saturated with a 7 per cent tincture of iodine. The foal received 0.5 Gm. of dihydrostreptomycin with 900,000 units of procaine penicillin G by injection, and the udder of the mare was washed with a soap solution. This is a standard procedure.

On April 22, the foal was unable to rise or nurse and had a temperature of 103.5 F., and increased respiration. Swelling and heat were evident over the right hip and stifle joints. There was no swelling or discharge at the umbilicus. A diagnosis of navel ill or polyarthritis was made. It was now learned that the mare had been discharging milk for about three weeks prior to foaling. Dihydrostreptomycin and procaine penicillin G injections were given. Radiographs of the affected stifle and hip showed no damage to the articular surfaces.

By April 24, the right hock and fetlock were involved and there was some evidence of involvement of both of the carpal joints. After a consultation with Drs. Jacques Jenney and Roger Maloney of Philadelphia on April 26, cultures were taken of the synovial fluids drawn from the joints. The synovia was turbid and aerosanguineous.

By April 28, the left hind leg showed swelling in the hock and fetlock joints and the right hind fetlock and both carpal joints were markedly enlarged.

The laboratory,* on May 1, reported a pure culture of a nonhemolytic *Micrococcus*. On sensitivity tests, this organism proved resistant to penicillin, streptomycin, chloromycetin,[†] Aureomycin,[‡] achromycin,[§] and terramycin,^{||} but it was sensitive to bacitracin.[¶]

Bacitracin (60,000 units per vial) was diluted with a 2 per cent procaine hydrochloride solution in normal saline. Starting on May 2, a dose of 20,000 units of this solution was administered intramuscularly

at various sites every eight hours. After four days of treatment, the foal showed improvement in the use of his legs and his temperature dropped to 102.5 F. By May 11, at which time treatment was discontinued, his temperature was normal, his general attitude improved, and he was using all but one leg freely. The swelling in most of his joints was receding but the right hind fetlock joint was greatly enlarged and the foal would place no weight on it.

On May 14, synovial fluid was aspirated from the left stifle, the carpal joints, and the right hind fetlock and 5,000 units of bacitracin was injected into each of these joints. Cultures from these synovial fluids were negative.

By June 1, the colt put weight on both hind legs but, when turned out with his dam, he ran "jack rabbit" style, i. e., hopping. It was August before he began to use both hind legs normally and September before the swelling in the right hind fetlock joint completely disappeared.

The colt is now apparently normal in every respect, recent radiograph studies showing no visible arthritic changes.

Conclusions.—(1) Despite the most meticulous care of the newborn foal, navel ill may occur.

2) By losing her milk and colostrum for a time prior to foaling, a mare may not be able to transmit sufficient antibodies through her milk to protect the foal from bacterial invasion.

3) Bacitracin produced no toxicity in the foal and apparently eliminated the infection.

4) This experience indicates the need for sensitivity tests in bacterial culture work for diagnosis and rational treatment.

Osteoporosis from Cortisone Therapy

Osteoporosis, caused by loss of the proteinaceous matrix of bone, may be due to an excess of certain adrenocortical hormones such as hydrocortisone, which have an anti-anabolic action whereby they prevent the building of proteins from amino acids. More than a dozen such cases have been reported. Some patients have developed osteoporosis and pathological fractures within a few months of starting cortisone therapy. Their sense of well-being may have led them to indulge in unaccustomed activities.—*Brit. Med. J., Jan. 29, 1955.*

Dr. Smith is a general practitioner in Hanover, N. J.

*School of Veterinary Medicine, University of Pennsylvania, Philadelphia.

†The bacitracin was supplied by Commercial Solvents Corp., Terre Haute, Ind., and Sharpe and Dohme, Philadelphia, Pa.

Newcastle Disease Passage in Pigs

Newcastle disease virus (NDV), inoculated intracerebrally into young pigs, produced symptoms of paralysis. The virus, which was at first not infective to pigs by the nasal route, became so after five passages. Pigs immune to Teschen disease were also immune to NDV inoculated intracerebrally. The virus lost its pathogenicity for fowl after the second passage in pigs.—*Vet. Bull., Feb., 1955.*

Damage May Be Done by Antibodies

Antibodies, whose function is to destroy foreign substances which have entered the body, may damage the cell to which those substances have become attached. This may change the permeability of the cell's wall and cause changes in cell function. This finding may lead to a better understanding of how viruses penetrate cells.—*Sci. News Letter, March 5, 1955.*

Leptospira Meningitis from Dog Bite

Three weeks after being bitten by a dog, a patient developed nausea, headache, a stiff neck, chills, moderate fever, dizziness, and incoordination. *Leptospira* organisms were found in the cerebrospinal fluid and urine of the patient and also in the blood and liver of an inoculated guinea pig. An agglutination-lysis test of the guinea pig's blood was positive for *Leptospira canicola* in a dilution of 1:100,000.—*Canad. J. Pub. Health, Jan., 1955.*

Enterotoxemia of Swine

Enterotoxemia or edema disease of swine showed a marked increase in 1954, according to the Iowa Veterinary Medical Diagnostic Laboratory at Ames. Common features reported for the disease were that it appeared suddenly and often affected the thrifty, fast-growing pigs, usually when 8 to 14 weeks old; the mortality was high and quick but some survived for five to seven days; the disease disappeared abruptly, and often occurred shortly after the pigs were vaccinated for cholera.

Early signs were a weak, incoordinated gait, apparent blindness, circling, muscular tremors, convulsions, and gradual paralysis. The temperature is usually normal but may be up to 105 F. Older pigs or animals with

mild infection often recover. Edema may occur in the eyelids, ears, subcutaneous tissues of the head and snout, lower abdominal wall, and around the rectum, but it is most commonly found in the stomach wall and in the mesentery along the large intestine. The "mulberry heart" and the "flea-bite" cutaneous hemorrhages, especially on the abdomen and medial surface of the rear legs, are less common. In the absence of edema, these hemorrhages deserve attention. Several cases were seen in pigs 4 weeks old or less.—*Iowa Vet., Nov.-Dec., 1954.*

Effect of Reserpine on Mental Patients

Reserpine, the chief active alkaloid in the Indian plant, *Rauwolfia serpentina*, demonstrated remarkable effects when used on 74 mentally ill and 15 mentally retarded patients. An average dose of 2 mg. daily, given by mouth for up to seven months, was beneficial to 80 per cent of the patients; the depressed became more alert and sociable, while the hyperactive, noisy group became tranquil. Although the dosage was high, side effects were infrequent and minor.—*J. Am.M.A., Oct. 30, 1954.*

Wildlife Carriers of Leptospira Pomona.—In a search for wildlife carriers of *Leptospira pomona*, various mammals were trapped in an enzootic area of Virginia. *Leptospiras* were cultured from several house mice and from 1 opossum but they proved to be *Leptospira ballum*. This is further evidence that the natural hosts of *L. pomona* are in the livestock population.—*Vet. Bull., Jan., 1955.*

Hyaluronidase in Acute Sprains

The results obtained with the local injection of hyaluronidase in 27 patients with acutely sprained ankles was compared with 92 similar cases treated as follows: 17 with faradism (electricity) massage and exercises; 25 with local injections of 2 per cent procaine; 25 with immobilization; and 25 with no treatment. Dramatic reductions in swelling occurred in the majority of patients treated with hyaluronidase, with an average recovery time of 3.1 days compared to 8.7 to 14 days in the control groups. No side effects were observed.—*J. Am. M. A., Jan. 15, 1955.*

Bronchogenic Carcinoma in the Cat

MATTHEW A. TROY, D.V.M.

Pelham, New York

VETERINARY literature contains few references to primary neoplasms of the lung in the cat. Monlux¹ published a monograph containing a comprehensive review of the literature relating to the incidence of primary pulmonary neoplasms in domestic animals during an 82-year period (1807 to 1952). In all, he enumerated 155 cases. Of these, 8 were feline cases, only 1 of which occurred in the period from 1940 to 1952. Boyd² states that in man primary cancer of the lung, once considered to be rare, is now becoming remarkably common due to improved diagnostic procedures.

CASE REPORT

On March 6, 1952, an 11-year-old, castrated male, red Persian cat was presented for examination. He appeared to be in good health, his weight being normal and his coat in fair condition. The owner stated that the cat had an unsteady gait, walked in circles with his head tilted to the right, and cried frequently—the latter being ascribed to keeping the cat in an apartment, whereas in their previous residence he had been allowed to go out at will. Examination revealed a slight rise in temperature and an area of dullness, but no abnormal sounds in the chest. His appetite was fair. He was not inclined to move and if picked up would scream, make frantic useless movements to regain his balance, and then have a brief tonic convulsion.

History.—The patient had first been seen in October, 1949, when he was troubled by a chronic otorrhea, the lining of the ear being swollen and covered with a catarrhal exudate. At that time, microscopic examination was negative for *Otodectes cynotis* mites, but the owner stated that they had previously been present. The cat was treated as an outpatient and responded to treatment then, and again when the condition recurred about a year later. On Jan. 15, 1952, he was returned because of a cough and specks of blood on his feces. He was hospitalized for two days and apparently recovered. However, on March 6, he was

again returned with the symptoms described. Due to his age and condition, euthanasia was performed.

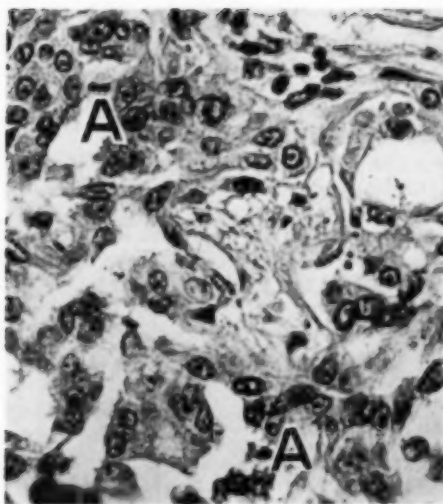
Gross Lesions.—The necropsy revealed no gross lesions other than the following: (1) narrowed auricular canals, due to conchal hyperplasia, and a blue cyst the size of a pinhead just opposite the ear drum of the right ear; (2) many milium white spots scattered over the outer surface of the liver and spleen; (3) the diaphragmatic lobe on the right lung was grayish white, with the appearance of a thick-walled cyst. When the lobe was incised, a grayish white, caseous mass oozed out leaving an empty sac with no normal lung tissue in this lobe. The brain was grossly normal. Tissues were forwarded to the Armed Forces Institute of Pathology for histological study.*

Histopathological Findings.—No significant lesions were seen in the brain. In the spleen, the red pulp was practically devoid of blood. Extensive fatty metamorphosis was present in the liver. In the pancreas there was marked islet hyperplasia in the form of large islands of islet cells and bordering on neoplasia. In the kidney, lymphocytes were present in the renal cortex; the Bowman's capsules were frequently thickened; the tubular epithelium of the convoluted tubules in the cortex contained much fat (not unusual in this species); and there was some fat in the glomeruli. There were foci of cartilaginous metaplasia in the ear between the normal plates of cartilage.

In the lung (fig. 1), some pulmonary architecture was almost completely destroyed and was recognized only by the presence of pleurae, cartilage plates, mucus glands, and a few remnants of pulmonary parenchyma. The remainder of the section was completely altered by necrosis and many cholesterol clefts, which probably accounted for the gross caseous appearance, and by the presence of numerous papillary folds or projections with a connective tissue core and anaplastic, neoplas-

*Dr. Troy is a small animal practitioner in Pelham, N.Y.

*The examination and report were made by Lt. Col. C. A. Gleiser, V.C., U. S. Army.



A.F.J.P. Acc. 527405

Fig. 1—Anaplastic carcinoma of bronchogenic origin. Note lack of normal pulmonary structure and mitotic figures such as in cells at A. Hematoxylin and eosin stain, x 450.

tive epithelial cells covering them. These cells were generally columnar, but with squamous metaplasia in certain areas. Mitotic figures were numerous. Many of the neoplastic cells contained mucus.

No evidence of metastasis was observed in either the liver or the spleen.

DISCUSSION

Boyd² described carcinoma of the lung in man as follows:

The chief symptoms are cough, bloodstained sputum, dyspnea and pain in the chest with breath sounds remarkably absent over the affected area, even though the bronchi may not be correspondingly narrowed. Tumor cells may be found in the sputum examined by the wet-film method. The carcinoma is essentially bronchogenic in origin with the size and appearance varying to an extraordinary degree. The most common finding is a firm, grayish white tumor in the region of the hilus, more or less related to a main bronchus, but it may be only a white fibrous thickening of the bronchial wall with narrowing of the lumen and only a suggestion of roughening of the mucosa. Secondary changes such as atelectasis, bronchiectasis, and abscess formation may greatly alter the gross appearance. If a main bronchus is blocked, a lobe or the entire lung may be completely collapsed. Sometimes the tumor itself is so

completely destroyed by an abscess that microscopic examination is necessary to detect its presence.

With regard to the microscopic appearance, Boyd states that possibly no tumor in man is so pleomorphic as cancer of the lung. The anaplastic cells may be round cell, spindle cell, or oat cell. The more differentiated cells are columnar or cuboidal in shape, and may be collected in groups (medullary arrangement) or arranged around glandlike spaces into which papillary processes may project (adenocarcinomatous arrangement). The tumor cells may grow alone inside the alveolar walls and form a new lining for the alveoli. These two arrangements may be grouped together as the glandular type. Finally, the differentiated cells may be squamous instead of columnar. These probably rise from the cells lining a bronchiectatic cavity which have undergone metaplasia into an epidermoid type of epithelium.

CONCLUSIONS

The tumor found in this cat was similar in many respects, in gross and microscopic appearance, to that found in man. In man, when there is neither pressure nor irritation caused by the tumor, there may be a paucity of symptoms directly related to the cancer just as there were in this cat. If the bronchus to the lobe involved is completely obstructed, and the other bronchi are patent, there will be no dyspnea. In addition, the partial circulation is cut off so that the aerated blood is not polluted by impure blood from the obstructed portions.

One difference is that while in man the tumor metastasizes rapidly, no metastases were found in this case.

References

- ¹Monlux, W. S.: Preliminary Pulmonary Neoplasm in Domestic Animals. Southwest, Vet., 6, (1953): 131.
- ²Boyd, W.: A Textbook of Pathology, 4th ed. Lea and Febiger, Philadelphia (1943): 447-454.

Can Chlorophyll Suppress Meat Odors?—Experiments were conducted to determine whether the odors of tainted meat might be fraudulently suppressed by the use of an aqueous solution of chlorophyll. It does not seem possible, since the quantity of chlorophyll needed imparts a noticeable green tint to the meat.—*Vet. Bull., Feb., 1955.*

Equine Leptospirosis Studies

Two horses naturally infected with *Leptospira pomona* developed periodic ophthalmia after an incubation period of one year and two years, respectively. Attempts to culture leptospiras from the blood, urine, and eye of 1 of these horses and from the affected eyes and other organs of 5 additional horses with periodic ophthalmia were unsuccessful. This does not lend support to the theory that leptospiras are the etiological agent in periodic ophthalmia, such evidence being primarily serological. Six cases of experimentally produced *L. pomona* infection in mature horses were characterized by a transient hemolytic anemia, with icterus in the more severely affected animals. All recovered without apparent residual damage. Blood cultures were positive only during the first two or three days of the three- to five-day febrile period. The organisms were not recovered from the kidneys except in 2 horses destroyed immediately after the febrile period.—*Cornell Vet., Jan., 1955.*

Signs of Equine Infectious Anemia.—Sublingual petechiae were found in 19 of 21 horses with equine infectious anemia, 10 having fewer than 50 petechiae and 7 having more than 200. Similar petechiae were found in 6 of 15 horses with other infections.—*Vet. Bull., Jan., 1955.*

Periodic Ophthalmia and Onchocerca.—In Austria, the microfilariae of *Onchocerca cervicalis* were found in the eyes of 78 of 102 horses affected with periodic ophthalmia and in 9 of 75 horses in which the adult parasite was found in the ligamentum nuchae.—*Vet. Bull., Feb., 1955.*

Whole Blood Therapy for Anaplasmosis

Seven mature Jersey cows at the Texas Agricultural Experiment Station, which had been experimentally infected with anaplasmosis, were given daily from the onset of symptoms, whole blood transfusions of 1,500 to 1,850 cc. each. There was no apparent benefit. Four of the 7 (57%) died in two to four days, which closely parallels the mortality in untreated cases. The incubation periods were twenty-seven to thirty-two days. On the first day of treat-

ment, the hematocrit ranged from 9.5 to 12.0. Three of the 4 cows which died were completely off feed.—*Southwest. Vet., Fall, 1954.*

Anaplasmosis Immunization

In the Belgium Congo, 3 calves free of *Anaplasma marginale* before and after splenectomy were inoculated with *Anaplasma centrale*, the inoculum also containing *Theileria mutans*. When blood from these calves was injected into 8,456 cattle, all were protected against *A. marginale* infection.—*Vet. Bull., Dec., 1954.*

Giving Proteins with Antibiotics

The administration of foreign protein (parenteral) simultaneously with antibiotic therapy is a valuable adjunct. Many cases whose response to penicillin is sluggish give a rapid and dramatic response with the addition of foreign protein therapy.—*Wm. H. Wright, D.V.M., New York.*

Feline "Distemper" and Antibiotics

The misleading term "feline distemper" is loosely used to cover several conditions: a virus gastroenteritis; infectious agranulocytosis; a contagious respiratory infection, probably caused by a virus; and infectious laryngoenteritis, also probably caused by a virus. Symptomatic treatment over a three-year period was ineffective. Streptomycin produced good results when given orally but not when given intramuscularly. Aureomycin® given orally had little effect.—*Vet. Bull., Feb., 1955.*

Control of the Swine Kidney Worm

Pigs developed kidney worm (*Stephanurus dentatus*) infestation after being fed earthworms which had been exposed to kidney worm larvae. This parasite is usually acquired by swine swallowing the larvae or by their lying on contaminated ground, the body heat stimulating the larvae so they penetrate the skin. The larvae are sensitive to dryness or low temperatures so their preservation and transference may be aided by earthworms which also serve as intermediate hosts for some lungworms.—*Agrie. Res., Jan., 1955.*

What Is Your Diagnosis ?

Radiograph Offered for Your Study and Diagnosis

Because of the interest in veterinary radiology, the JOURNAL publishes this month, and will continue to do so for the next several issues, a case history and accompanying radiographs depicting a diagnostic problem.

Make your diagnosis from the picture below — then turn the page ▶

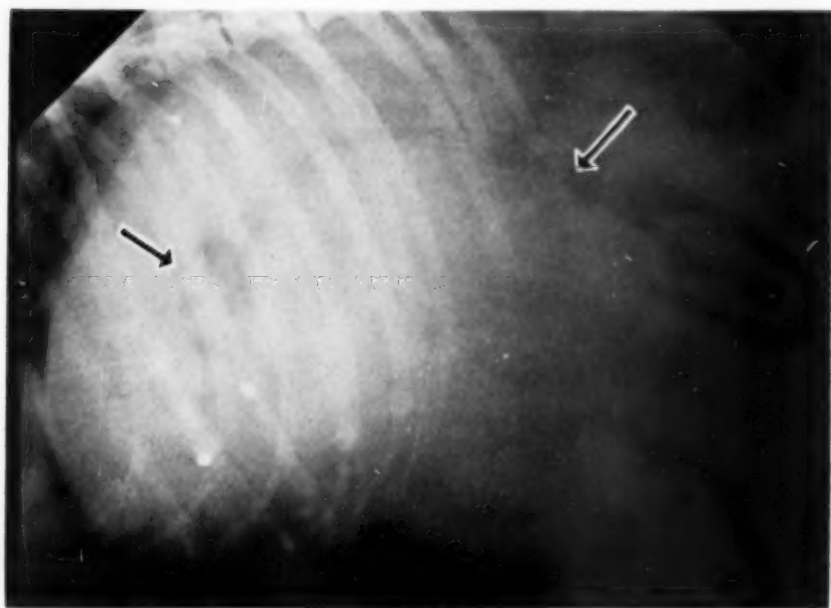


Figure 1

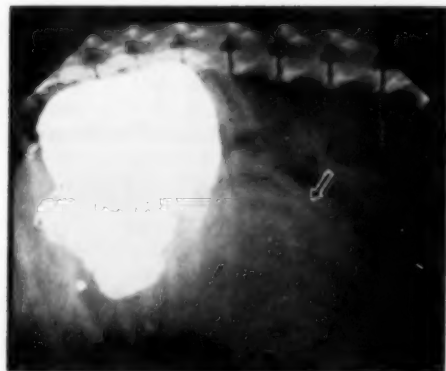


Figure 2

History.—A 15-year-old male dog of mixed breed had been off feed for a week, unable to get comfortable, and had evinced pain in the abdominal region upon handling. Radiographs (fig. 1 and 2) were made and a large mass was noted in the region of the stomach. An operation was recommended.

(Diagnosis and findings are reported on next page)

Here Is the Diagnosis

(Continued from preceding page)

A laparotomy was performed and a well-encapsulated hematoma 13 by 7 by 7 cm. was found adhered to the liver and peritoneum. It was removed and the dog made a good recovery.



Fig. 3—Encapsulated hematoma removed from the abdominal cavity of the dog, radiographs of which are shown on the preceding page.

Our readers are invited to submit case histories, radiographs, and diagnoses of interesting cases which are suitable for publication.

This case was submitted by Dr. William C. Banks, of the veterinary hospital at Texas A. & M. College, College Station, Texas.

Incidence of Canine Diactophymiasis (Giant Kidney Worm Infection) with a Summary of Cases in North America

FRANK A. EHRENFORD, Ph.D., and THOMAS B. SNODGRASS, D.V.M.

New Augusta and Zionsville, Indiana

THE GIANT kidney worm, *Diactophyma renale*, is an important parasite for several reasons, among those being: its host pathogenicity, its widespread host and geographical distribution, its canine and commercial mink problems, and a rare zoonosis of human medical interest.

The incidence of infection in other hosts is unknown and in man and the dog is imperfectly known. The records on infection in dogs do not accurately reflect the true incidence, because the reports cover limited cases from restricted geographical areas.

No successful treatment except surgical intervention is known. Control measures rely entirely on prophylaxis which consists of prohibiting the consumption of raw or improperly cooked fresh-water fish, particularly the catfish (*Ameiuridae*) of North America.

It is probable that many infections in mammals result in a biological blind alley for the parasite, especially when one or several of the same sex are present in the abdominal cavity, or when an accidental host is involved. Because of its peculiarities this helminth will persist as a zoological and parasitological curiosity.

CASE REPORTS

Five cases of *D. renale* were observed by the co-author (T.B.S.). In 2 cases, unfortunately, no estimates of pathological changes were made. However, in each case 1 adult worm was found in the abdominal cavity of the dogs. Data are presented on the other 3 cases.

Case 3.—On Aug. 8, 1953, upon necropsy, a 6-month-old male Cocker Spaniel from Ohio showed a severe peritonitis and a severely inflamed mesentery. The kidneys appeared normal. The liver was largely defaced with eroded, irregular slits about 1 inch long, with other areas covered by a conspicuous serofibrinous clot. Three adult

female *D. renale* were found measuring 86.2 cm. by 10 mm. and 76.2 cm. by 10 mm. (one broken) and weighing 44.0, 46.5, and 40.0 Gm., respectively (measured after death in 70% alcohol).

Case 4.—An 18-month old part-Shepherd male from Kentucky was necropsied on Nov. 11, 1953. Moderate peritonitis and a moderately inflamed mesentery were seen. The capsule of the right kidney had a 6-mm. perforation which was discharging a sero-sanguineous exudate. The liver showed several eroded slits and a few small areas covered with a conspicuous serofibrinous clot. Only 1 adult female *D. renale* was found, measuring 88.7 cm. by 10 mm. (maximum width) (35.5 by 0.4 in.) and weighing 76.1 Gm. (2.6 oz.) alive.

Case 5.—A 1-year-old part-Shepherd female from Ohio upon necropsy, April 12, 1954, showed moderate peritonitis and a severely inflamed mesentery. The kidneys were normal in appearance, but the liver showed several eroded slits and several areas covered with a serofibrinous clot. One adult female *D. renale*, 93.7 cm. by 10 mm. (alive), was found.

In these 5 animals, there were no gross signs of parasitism. The gross pathological lesions described at necropsy agree well with several others reported.¹⁰

A total of 57 recorded cases were summarized by Underwood and Wright,¹⁰ and Meyer and Whitter¹² resummated adding 26 new cases. These 83 cases came from: Iowa, Canada, South Carolina, New York, Ohio, Illinois, a western state (coyote), District of Columbia, Pennsylvania, and Kentucky. In addition, Dikmans⁷ reported cases in Maryland, Virginia, and North Carolina. Table 1 summarizes cases not included by Underwood and Wright¹⁰ and Meyer and Whitter.¹² These combined data give a total of 121 canine cases cited in the literature.

Observations on the incidence of canine diactophymiasis have varied widely (0.29% to 37%). Present data (table 2) indicate a much lower incidence than heretofore reported.

Dr. Ehrenford is parasitologist and Dr. Snodgrass is veterinarian with the Pitman-Moore Co., New Augusta and Zionsville, Ind.

The authors gratefully acknowledge the assistance of Mrs. Leona Pratt, Mr. Leon Wilson, and Mr. Jack Smith in obtaining data.

TABLE 1—Cases of Canine Diactophymiasis Not Shown in the Summaries of Underwood and Wright (1934)¹² and Meyer and Whittier (1950)¹²

Author	Number	Locality
Wislocki (1919) ²⁰	19	Maryland
Schwartz (1925) ²⁶	1	District of Columbia
Stiles (1925) ¹⁶	1	Maryland
Wright (1935) ¹⁴	1	South Carolina
Wright (1935) ¹⁴ re Crowe (1907) ⁶	1	Maryland
Wright (1935) ¹⁴ re Riley (1916) ¹⁴	2	Unknown
Moore and Schooley (1939) ¹⁸	1	North Carolina
Koutz (1944) ¹⁰	3 (ova seen)	Ohio
Meyer and Whittier (1950) ¹²	1	Kentucky
Cooperrider (1952) ⁵	7	Georgia
Cooperrider, Robinson, and Staton (1954) ⁴	1	North Carolina
Senter (1954) ¹¹	1	Tennessee
McGilvray and Brown (1955) ¹¹	1	Canada
Ehrenford and Snodgrass	5	Ohio, Kentucky
Total	58	

DISCUSSION

The 121 cases of *D. renale* represent an unknown total of dogs examined, except as indicated in table 2. It would appear that the 0.003 per cent represents a truer incidence than has been indicated by previous surveys. This opinion is supported by observations on dogs coming from nine states in the Ohio and Mississippi drainage system (Ehrenford⁵). Also, since infected dogs have previously been reported from this region, present data are derived from an area known to be positive for *D. renale*.

The examination of urine and observations at necropsy are the only methods available for the diagnosis of *D. renale*. However, necropsy is the most comprehensive approach since it reveals the presence of adult worms, while urinalysis only shows the presence of egg-laying females in the kidney.

Diactophyma renale occurs in a variety of fish-eating mammals, even herbivores, and has a worldwide distribution. Woodhead²² explained the life cycle of *D. renale* by showing that branchiobdellids, which are commensal on crayfish, and the catfish are first and second intermediate hosts, respectively. From this study, strong evidence developed to show that wild fish-eating carnivores such as mink are normal definitive hosts, while dogs and other hosts are abnormal hosts. In support of the idea that mink are normal hosts are the data that larger numbers of *D. renale* are found in mink than in dogs. The worms are smaller in mink, but they are usually located in the kidney, permitting passage of eggs in aquatic situations containing the appropriate intermediate hosts. In the dog, however, the worms are found in smaller num-

bers (not infrequently a single worm), are much larger, and are usually found free in the abdominal cavity, hence the eggs do not pass out of the host.

The incidence of *D. renale* in wild mink

TABLE 2—Incidence of Canine Diactophymiasis as Found by Several Authors

Author	No. of dogs examined	Infected dogs (%)
Sommer in 1895 (Wislocki) ²⁰	50*	2.0
Hall (1917) ⁹	67*	5.0
Wislocki (1919) ²⁰	3,200*	0.37
Brown and Sheldon (1940) ¹	54*	57.0
Koutz (1944) ¹⁰	1,486†	0.29
Ehrenford and Snodgrass	131,152*	0.003

*Examined by necropsy. †Examined by fecal flotation.

appears to confirm the status of mink as the primary definitive host. Of a relatively small number of mink examined, Woodhead and McNeil²¹ found 8.6 per cent infected, and Sealander¹⁵ found 2.5 per cent infected. Nevertheless, as a reservoir of enzootic diactophymiasis, mink appear to be ideally suited. Their fish-eating habits (Cahalane³) are conducive to receiving the pre-adult stages of *D. renale* from catfish. In addition, the distribution of canine infections falls well within the distribution range of mink (Burt²).

Certain substantial gaps in our knowledge exist; the catfish may not be the only secondary intermediate host, i.e., along coastal or arctic regions, mink is presumably the primary definitive host (other possible secondary reservoirs might be skunks, martens, and otters since *D. renale* has been recovered from these fish-eaters). Enzootic foci of canine infections are ill-defined at present. There is need for more field data on the incidence of *D. renale* in

wild fish-eating mammals, on the larval incidence in fish intermediate hosts, and on canine cases to clarify this interesting ecological problem and also to delineate areas of potential danger for human infection.

Data on canine cases point to the conclusion that, by reason of his fishing habits, close association with his dog, and the concomitant presence of appropriate intermediate and reservoir hosts, man is solely responsible for the maintenance of canine infections of *D. renale*. It follows then, from the life history data of the parasite, that dogs and man are accidentally infected by disturbing the normal enzootic cycle.

SUMMARY

1) Five new cases of canine dictyophymiasis (giant kidney worm infection) are reported.

2) A total of 121 cases of canine dictyophymiasis have been recorded in North America.

3) The incidence of canine dictyophymiasis in one large sampling is 0.003 per cent.

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Rabies in Nonsanguivorous Bats

A survey conducted in nonsanguivorous bats of Texas has established that the Mexican free-tailed bat (*Tadarida mexicana*) is a host for the virus of rabies and that extensive inapparent infections occur in this species. This is indicated by the development of neutralizing antibodies for the virus, and is considered the result of naturally acquired inapparent infections. The investigation was undertaken on a military reservation because of a malady afflicting the bats.—*Science*, Oct. 1, 1954.

Tularemia via Alimentary Infection

Tularemia was reported for the first time in western Europe in two patients. A game warden had a cutaneous glandular infection from a contusion on the hand. Abdominal symptoms were predominant in the second patient who apparently had been infected by eating an inadequately cooked hare pie. Treatment with aureomycin® was effective in both cases.—*J.A.M.M.A.*, Feb. 19, 1955.

NUTRITION

The Effect of a Low Protein Ration in Hog Cholera Immunization

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THERE HAS BEEN evidence of increasing difficulty in establishing strong immunity against hog cholera. Various reasons have been given to explain immunity failures in herds of hogs that were thought to have been adequately protected. With new emphasis being placed on the eradication of hog cholera, it was thought a controlled investigation of some of the factors believed to interfere with development of strong immunity should be carried out.

One of the factors which is said to interfere with the development of strong immunity to hog cholera is a protein deficiency in pigs at the time of vaccination. There have been frequent allusions in the literature to the necessity of providing ample protein in the ration of swine to be vaccinated against hog cholera,¹⁻⁵ and many practicing veterinarians have advised their clients that swine on a low protein ration are to be regarded as "poor vaccination risks." However, there has been a dearth of controlled experimental evidence reported which would definitely establish the necessity of providing adequate levels of this nutrient prior to hog cholera immunization.

Probably the most extensive work that has been done along this line in recent years was reported by Cannon.⁶ In working with rats, he reported that those being fed a ration adequate in every dietary essential except protein were more susceptible to induced infections and could not be immunized against infectious agents as effectively as could well-nourished rats. In another report,⁷ Cannon explains that he believes prolonged malnutrition has an adverse effect upon phagocytic activity, and that antibody formation is restricted because of decreased globulin synthesis. Smith,⁸ Raffel,⁹ and others have supported this view.

A somewhat opposite view has been expressed by Gell¹⁰ and Schneider.¹¹ Both reported from their

observations that a severe and prolonged protein deficiency was necessary to interfere with antibody production. The inference was that such a severe deficiency would not exist under natural conditions.

In an effort to establish the importance of protein in the immunization process, an experiment was set up to compare the immunity of pigs vaccinated while on a high protein ration plus pasture with those on a ration as low in protein as might feasibly be provided under farm conditions.

EXPERIMENTAL PROCEDURE

The general plan followed was to divide sows at breeding time into two lots. The sows of lot 1, referred to as the pasture lot, were provided with a ration as nearly complete as could be devised and given access to bluegrass pasture. The sows of lot 2, referred to as the drylot, were fed a ration consisting of 95 parts ground yellow corn and 5 parts linseed oil meal plus a mineral mixture of equal parts of steamed bone meal, ground limestone, and salt. The sows in this lot were not allowed access to pasture but were kept on a small plot of ground which was practically devoid of all vegetation. Sows of each lot were kept on these same rations throughout gestation and lactation. The pigs of each lot were weaned each year at approximately 8 weeks of age but were continued on the same ration as that of their mothers. Two weeks after weaning, all pigs were vaccinated against hog cholera with various products available for hog cholera immunization. Thirty days after vaccination, all pigs were placed on a well-balanced fattening ration. Ninety days after vaccination, the immunity of all pigs was challenged by the injection of 4 ml. of fresh hog cholera virus intramuscularly. Daily temperature recordings and observations were made on all pigs for two weeks following challenge. At least 2 cholera-susceptible pigs were challenged at the same time to establish potency of the virus.

RESULTS

In 1951, the first year of the experiment, 9 sows were used to produce a total of 56 pigs for immunization purposes (table 1). The immunizing agent used was antiserum and virus given according to the manufacturers' recommended minimum dosages.

From the Department of Veterinary Pathology, School of Veterinary Medicine, University of Missouri, Columbia. Journal series No. 1504.

There were no losses in either lot following challenge. Temperature charts showed an average increase of 1.3 degrees (F.) in both lots on the third day after injection but this receded on the fourth and fifth days. The average daily temperatures of the drylot pigs were approximately 0.8 de-

evaluate the possibility of a boost in body protein which might have been provided by the use of antiserum in the first year's tests. Following challenge, all groups of pigs showed temperature rises on the third and seventh days. There was again a higher average temperature in the drylot pigs of all groups over those in the pasture lot. Five pigs in group F and 2 in group C which died following challenge showed typical symptoms and lesions of hog cholera.

TABLE 1—Hog Cholera Immunization Trials [1951]

	Lot 1 balanced ration & pasture	Lot 2 low protein in drylot	Con- trols
No. pigs vaccinated	22	34	0
No. pigs challenged	22	29*	2
Survived challenge	22	29	0
Died of cholera	0	0	2
Pigs with temp. of 105 F. or higher following challenge	5	16	2

*Five pigs died from causes not connected with vaccination.

grees higher than those of the pasture lot throughout the challenge period, which probably accounts for the greater number of pigs in the drylot showing temperatures of 105.0 F. or higher as indicated in table 1. This higher average temperature has been explained on a physiological basis¹² and may not have any significance in so far as immunity is concerned.

In the second year of the experiment (1952), each lot of pigs was divided into three groups, making possible the use of two of the newer types of vaccine on the market (table 2). Groups A and D received antiserum and virus as in the preceding year; groups B and E received a modified virus vaccine of porcine origin designed to be used with 15 ml. of antiserum; and groups C and F received a single dose of modified virus vaccine of rabbit origin. It was thought the use of a single dose of vaccine would provide an opportunity to

In the third year (1953), the pigs of each lot were again divided into three groups (table 3). Groups A and D received antiserum and virus with a maximum of 15 ml. of antiserum. Groups B and E received a single dose of vaccine of rabbit origin plus 15 ml. of antiserum. This vaccine was manufactured by a different company than that used in 1952. Groups C and F were vaccinated with this vaccine alone. Four pigs were left untreated and maintained in the same pens with groups B, E, C, and F to check on possible contact with virus in these groups, which might stimulate further immunity. There was no evidence of illness in these 4 pigs during the feeding period. Two of them were then used as controls to test the virulence of the challenging virus.

Following challenge, the pigs of groups A and D showed little temperature response although 1 pig in each group showed a temperature of 105.0 F. or higher, but for only one day out of the entire test period. The pigs of group B showed little evidence of reaction from the challenge and their temperatures remained normal except for 1 pig with a temperature of over 105.0 F. on the third day after challenge but with no increase on the seventh day. The pigs of group E developed a noticeable reaction

TABLE 2—Hog Cholera Immunization Trials [1952]

	Lot 1—balanced ration and pasture			Lot 2—low protein in drylot			Controls
	Group A Serum and virus	Group B Vaccine and serum	Group C Vaccine alone	Group D Serum and virus	Group E Vaccine and serum	Group F Vaccine alone	
No. pigs vaccinated	23	16	16	15	15	16	—
No. pigs challenged	23	16	16	14*	12†	15	4
Survived challenge	23	16	14	14	12	10	0
Died of cholera	0	0	2	0	0	5	4
Pigs showing temp. of 105 F. or higher following challenge	0	6	3	5	6	9	4

*One pig died from causes not connected with vaccination. †Three pigs died from causes not connected with vaccination.

TABLE 3—Hog Cholera Immunization Trials (1953)

	Lot 1—balanced ration and pasture			Lot 2—low protein in drylot			Controls
	Group A Serum and virus	Group B Vaccine and serum	Group C Vaccine alone	Group D Serum and virus	Group E Vaccine and serum	Group F Vaccine alone	
No. pigs vaccinated	20	21	21	22	21	22	—
No. pigs challenged	20	21	21	21*	21	21*	2
Survived challenge	20	21	21	21	21†	21	0
Died of cholera	0	0	0	0	0	0	2
Pigs showing temp. of 105 F. or higher following challenge	1	1	0	1	11	4	2

*One pig died from causes not connected with vaccination. †Temperatures averaged over 104 F., with diarrhea, weakness, and anorexia on the third and fourth days after challenge, followed by rapid recovery.

following challenge. Their average temperature jumped to 104.3 F. on the third day after challenge and 104.2 F. on the fourth day. Thereafter, it receded sharply until the seventh day, at which time it showed a slight rise of 0.7 degrees. The early temperature rise was accompanied by scouring, weakness, and anorexia in some of the pigs. However, there were no death losses and affected pigs recovered rapidly. The pigs in groups C and F showed no unusual reaction following challenge. Some of the pigs in group F developed a temporary temperature increase on approximately the seventh day but there was no other evidence of illness.

Further work was carried on during 1954 with a single dose of vaccine of rabbit origin and the vaccine plus 15 ml. of anti-serum. The basic plan of placing all pigs on a balanced fattening ration thirty days following vaccination was altered by continuing approximately one half of the pigs of both lots on the same rations as their mothers for forty-five days after vaccination and submitting them to challenge at that time. This was done to evaluate the effect of low vitality and malnutrition upon

the ability to withstand challenge. The remaining pigs were handled in the usual manner (table 4). Susceptible pigs were kept in the same pens with the various groups to determine if there was any exposure to virus during the intervening period.

There was little reaction in the pasture groups A and B from challenge at forty-five days after vaccination. The 2 pigs with temperatures of 105.0 F. or higher each showed this for a single day, on the third and seventh day, respectively. Groups E and F of the drylot pigs showed somewhat more reaction but of a temporary nature. The pig listed as dying in group F showed lesions of severe malnutrition with complications, rather than those of typical hog cholera. The 2 control pigs died on the fifteenth and sixteenth days, respectively, and showed lesions of hog cholera with complications.

Seven pigs in groups C and D, challenged at ninety days, showed a temporary reaction as indicated by temperature curves. Some of this may be discounted because of an erysipelas flare-up in some of the pigs at the beginning of the challenge period.

TABLE 4—Hog Cholera Immunization Trials (1954)

	Lot 1—balanced ration and pasture				Lot 2—low protein in drylot				Controls
	Challenged 45 days after vaccination		Challenged 90 days after vaccination		Challenged 45 days after vaccination		Challenged 90 days after vaccination		
	Group A	Group B	Group C	Group D	Group E	Group F	Group G	Group H	
	Vaccine alone	Serum and vaccine	Vaccine alone	Serum and vaccine	Vaccine alone	Serum and vaccine	Vaccine alone	Serum and vaccine	
No. pigs vaccinated	19	19	13	12	19	20	17	16	—
No. pigs challenged	19	19	13	12	19	19 ^a	17	14 ^a	4
Survived challenge	19	19	13	12	19	18	15 ^b	13 ^b	0
Died of cholera	0	0	0	0	0	1 ^{ab}	2	1	4
Pigs showing temp. of 105 F. or higher following challenge	0	2	2	5	2	3	4	4	4

*One pig died from causes not connected with vaccination. †Two pigs died from causes not connected with vaccination. **Evidence of severe malnutrition rather than typical hog cholera. ‡Several showed severe reactions with diarrhea, weakness, and anorexia.

Several pigs in groups G and H developed severe reactions to challenge, characterized by scouring, weakness, and anorexia. The pigs that died during the challenge period showed typical lesions of hog cholera. Two control pigs inoculated at the same time died on the eighth and twelfth day, respectively.

DISCUSSION

From the results obtained, it seems apparent that the feeding of sows and their pigs on a ration grossly deficient in protein did not prevent immunization of the pigs against hog cholera when vaccinated with antiserum and virus. Differences in average temperatures of pasture lot and drylot pigs were not considered especially significant in relation to immunity.

The use of modified virus vaccines, either alone or in conjunction with small doses of antiserum, showed some variation in protective ability. With one exception (1952 trials), death losses and clinical symptoms resulting from challenge occurred only in the pigs on low protein rations. This would seem to indicate that these pigs failed to become solidly immunized because of a deficiency of protein or some other element deficient in the ration provided. On the other hand, only a relatively small percentage of pigs on the low protein ration were visibly affected, the majority surviving challenge with nothing more than a temporary temperature rise. This would indicate that some other factor or factors must have been involved in the few pigs failing to become solidly immunized. However, such factors may have been aggravated by the deficient ration provided.

Results obtained when pigs were challenged at forty-five days after vaccination and while still being fed a deficient ration were inconclusive. The commercial virus used to challenge these pigs was not the same brand as had been used previously and appeared to lack virulence; the control pigs seemed to be mildly affected and did not succumb until the fifteenth and sixteenth days after injection of the virus. Perhaps this part of the experiment should be repeated, and the study of other factors which may be involved should be continued.

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Condensed Whale Solubles as Feeds

In Australia where seasonal shortages of meat occur, a by-product of the reduction of whale carcasses into whale meal was tried as a protein substitute. This material containing only incidental solids was acidified and concentrated into a thick viscous fluid. It was mixed with coarsely ground grain, dried, and reground. It made a satisfactory replacement for meat meal for pigs and poultry and did not taint their flesh.—*J. Agric. South Australia*, Nov., 1954.

Mink Farmers Wary of Stilbestrol

Because of past production losses when the offal of stilbestrol-treated chickens was fed to mink, the Committee on Research of the National Board of Fur Farm Organizations has recommended that tripe from cattle be avoided as mink feed until research is completed. Biological tests of the meat and viscera from the hormone-fed cattle at Iowa State College showed no detectable residue of stilbestrol. However, it is feared that some hormone may adhere to the tripe which now is fed in large quantities.—*Nat. Fur News*, Feb., 1955.

Blindness Due to Vitamin A Deficiency

Vitamin A deficiency appears to have been the cause of considerable blindness in beef cattle in Alberta. Ophthalmoscopic examination revealed degenerative changes and edema of the optic papillae in 2 animals and, in 1, dissection of the optic nerve disclosed constrictions of the nerves where they passed through the optic foramen. The hay fed usually was not of high quality. However, blindness has occurred where the alfalfa was of fair quality.—*Canad. J. Comp. Med. and Vet. Sci.*, Feb., 1955.

Modern Feeding Plans for Young Pigs

Answers to a questionnaire from 1,400 Iowa farmers indicate that 78 per cent feed a creep or starter formula to their young pigs. Of this group, the feeding was started when the pigs were less than 10 days old by 18 per cent, when 10 to 14 days old by 43 per cent, and when 15 to 24 days old by 21 per cent. The pigs were weaned when 3 to 6 weeks old by 12 per cent, when 6 to 8 weeks old by 33 per cent, 8 to 9 weeks by 42 per cent, and when 9 weeks or older by about 13 per cent.—*Wallace's Farmer*, Dec. 18, 1954.

Fertilizer Increases Plant Fluorine

By heavy fertilization of a nonfluorine soil with Tennessee brown rock phosphate containing 3.6 per cent fluorine, the fluorine content of corn was increased 6 times and of camellia leaves 11 times. Rats 22 to 90 days old on these feeds gained more weight than the controls, their bones were more normally calcified, and they were less affected by dental caries; however, some developed fluorosis of the incisors. In a similar manner the iodine content of plants was increased by the application of 1 lb. of potassium iodine per acre.—*J. Agric. and Food Chem.*, Jan., 1955.

Magnesium Deficiency in Calves

Magnesium is required for growth, reproduction, and the prevention of grass tetany. When a synthetic fluid, adequate in all essentials except magnesium, was fed to 7 baby calves, they developed signs of deficiency such as a peculiar carriage of the head and ears, hypersensitivity, twitching of the skin, apprehensiveness, tremors, frothing at the mouth, and in five to seven

weeks convulsions and death. Necropsies revealed hemorrhages in the heart and kidney. Controls given 19 mg. of magnesia per 100 ml. of the synthetic milk remained normal.

A calf's requirement is estimated at 16 to 18 mg. of magnesium per 100 ml. of milk which is considerably higher than the 7 to 10 mg. usually found in cow's milk.—*Nutr. Rev.*, Jan., 1955.

Effect of Growth Hormones on Swine

Decades of selection of swine to increase their rate of gain may have developed strains which produce more of the growth hormone of the anterior pituitary gland, as indicated by a difference in the growth hormone secretions in fast- and slow-growing animals. To test this theory, pigs were injected daily with thyrotropic and gonadotropic hormones from the time they weighed about 100 lb. to past 220 lb. The injected pigs had a lower dressing percentage and less fat deposit but a higher protein and moisture content than did control pigs. Apparently the hormones stimulated the "true growth" of the animals.—*J. Anim. Sci.*, Feb., 1955.

Penicillin Relieves Cobalt Deficiency

Two sheep, raised and fed entirely on a cobalt-deficient farm, were given 50,000 units of penicillin daily for five weeks. After three weeks, both began to eat more concentrates and to gain as they would had cobalt or vitamin B been fed. The penicillin is assumed to have affected the rumen flora so that the bacterial synthesis of vitamin B₁₂ was increased.—*Vet. Bull.*, Dec., 1954.

Feeding High Levels of Antibiotics.—When aged rats were continually fed streptomycin and terramycin® at levels of 0.02 and 0.04 per cent, respectively, their life span was shortened by 10 per cent. This level supplied 10 to 12 mg. per pound of body weight which is many times the level used for growth stimulation.—*The Feed Bag*, Jan., 1955.

Vitamin A and Avian Coccidiosis.—When vitamin A was fed to 102 vitamin-deficient cockerels, their resistance to *Eimeria tenella* infection was increased over that of 42 deficient pen mates.—*Vet. Bull.*, Jan., 1955.

EDITORIAL

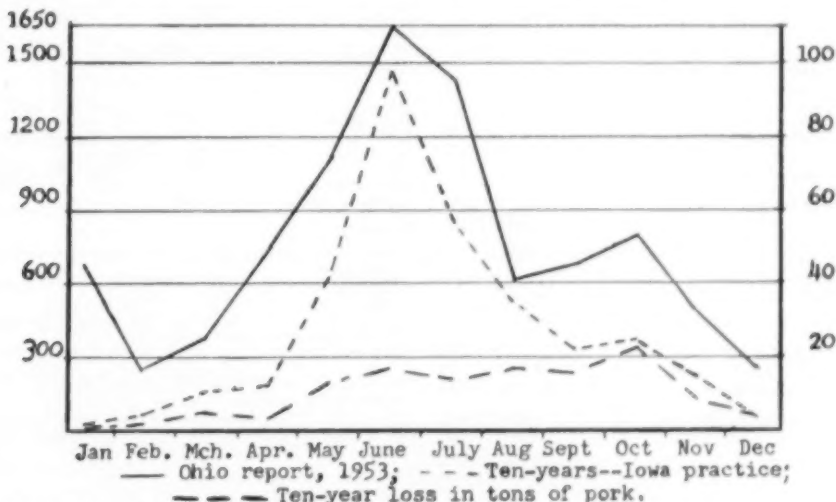
A Major Annual Challenge

The nation's largest crop of an annual type in the livestock field is swine, a crop which is now reaching its peak; and its most potent livestock killer is hog cholera, a disease to which the pig crop is born susceptible or, if the dams were immune, becomes susceptible at about 4 weeks of age. Therefore, annually about now, the veterinarian with a swine practice is faced with a major challenge.

With any disease a prompt, accurate diagnosis is important; with hog cholera it is imperative. When faced with 1 or more sick pigs in a cholera-susceptible herd, and unfortunately an occasional herd is yet or again susceptible even if vaccinated, the diagnosticians first concern must be cholera. To fail to at once consider and eliminate the possibility of the disease being cholera is like playing Russian roulette with one's professional reputation as well

as with the owner's property. A wrong diagnosis may mean several days later an entire herd sick, and in another two or three weeks an empty hog lot. Because of cholera's slow, relentless course and the slow burn of the owner, his friends and neighbors, no error in diagnosis could be more embarrassing.

Being a slowly developing, as well as a relatively lesionless disease, cholera, until its later stages, is easily confused with other septicemias and even with some intoxications. It also can be masked by concurrent diseases. In addition, cholera seems to have developed in recent years some complicating features and atypical forms, possibly due to different strains of the virus whether they be called variants, mutants, or by some other name. (For information on a related disease, African swine fever,



Graph 1 — The seasonal prevalence of swine erysipelas is shown in these strikingly similar curves. The Ohio curve indicates individual cases (numbers on the left) reported by Ohio practitioners in 1953. The Iowa curve shows the herds affected (numbers on the right) totaled for each month in one practice (writer's) from 1941 to 1950 inclusive; it includes no chronic erysipelas. The pork-loss curve indicates the tons of pork (numbers on the right) which would have been lost in ten years had the affected animals in the Iowa practice died. The prevalence of the disease in June and October is marked.

see the JOURNAL, April, 1955: 313, and this issue, pp. 389-391.)

Of the septicemic swine diseases which must be differentiated from cholera, salmonellosis, and others which may occur sporadically, can be confusing, but the most common disease in this category is the acute form of swine erysipelas.

Swine erysipelas in itself can be most puzzling. None of our common animal diseases is more variable or unpredictable. For practical purposes, the acute and chronic forms of erysipelas might well be considered as relatively distinct diseases. Except for their etiology, they are about as different as anthrax and certain nutritional deficiencies.

DIFFERENTIATING CHOLERA FROM ACUTE ERYSIPELAS

With swine erysipelas appearing in new areas while hog cholera seems to be decreasing, some of the younger practitioners may be confronted with the problem of differ-

entiating between these two diseases without the benefit of experience with either of them. Table 1 may therefore be helpful.

The history, symptoms, and lesions when considered together are usually quite indicative of the proper diagnosis but occasionally are misleading. The only positive sign of erysipelas is the urticarial wheals over the back. On the other hand, the only positive evidence that cholera is not present is the recovery after the penicillin and serum therapy. It is wise to give this therapy test as soon as possible, not only to obtain a quick field diagnosis but to save swine that might otherwise die in a few hours if they do have erysipelas.

Comments on the age distribution of erysipelas from two experienced laboratory diagnosticians indicate that acute erysipelas occurs less frequently in young pigs than many believe. They strongly advise that an "accurate diagnosis" be obtained in such cases and that the therapy be adjusted accordingly.

TABLE 1—Differential Features of Hog Cholera and Swine Erysipelas*

Cholera	Erysipelas (acute only)
Typical Histories	
Entire herd usually sickens in a few days, often preceded a week or so by 1 or a few sick. Recovery is rare.	Sudden death of 1 or many, or they may linger several days. Many recover or become chronic.
Common Symptoms	
Appetite—food seems distasteful. Mental state—depressed, stand and "think." Eyes—congested, purulent. Gait—slow, wobbly.	Eat well (75%)** until seriously ill. Alert until seriously ill. Bright but may be congested. Active but often "creepy" or back arched and limbs stiff from edema. Often "where" due to edema of nares, may be rapid due to congestion and edema (26%) of lungs. Normal (74%), diarrhea, often yellowish (6%), constipation (20%). Erythema (55%), urticaria (6%).
Common Lesions	
Lymph nodes—variable congestion, often peripheral. Exudate in cavities—absent. Petechiae—usual on kidney, lungs, often in larynx, bladder. Gut—usually empty, some inflamed areas, often "button ulcers" near ileocecal valve. Kidneys—normal except for petechiae may be like "turkey eggs." Spleen—normal unless border infarcts or small hemorrhages.	Uniformly congested (56%), edematous (clear—10%, yellowish—32%). "Cobwebs" in peritoneal (45%), fluid or coagulated (16%). Kidney (20%), stomach (26%), "paint brush" on stomach (18%), heart (6%), other organs (15%). Congested mucosa in stomach (80%), intestine (8%). No change (20%), petechiae (20%), congested (52%), "marbled"*** (18%). No change (18%), uniformly swollen (75%, may be 2 to 3 times), irregularly swollen (6%), border infarcts (7.5%).
Therapeutic Diagnosis	
Give sick pigs penicillin (1,000 units/lb.) with either serum.	
If cholera—no response.	If erysipelas—temperature normal and pig improving in 8 to 24 hours. Full recovery time tends to equal length of illness.
(If in doubt and herd is unvac-inat-d give hog cholera serum to all.)	

*Briefed and revised from The Speculum, Autumn, 1952.

**Percentages shown are averages, including estimates of five diagnostic laboratories and records on 218 field necropsies from the writer's practice, of which 30 per cent were laboratory-confirmed.

***Marbled indicates alternating, large bluish and pale areas (observed in 29% of the field series cases and considered quite diagnostic).

One of the observations reported many years ago by Van Es was that swine erysipelas seemed to be most prevalent in the summer and fall, reaching peaks in June and October.

Graph 1 shows how astute that observation was. It includes the "monthly incidence of swine erysipelas for 1953 plotted for 8,237 cases reported by Ohio veterinarians" (from *Animal Disease Trends*, Ohio Department of Agriculture). It also shows the total number of herds affected in each month for ten years (1941-1950) in a northwest Iowa practice, and the relative monthly losses during that ten years had every affected pig died. Because of their greater value as shoats, the greatest loss would have been in October.

This emphasizes the importance of having as solid an immunity as possible during the fall period. The plan suggested by Schuman¹ of vaccinating gilts about breeding time with culture (where it is available) and serum to protect their pigs while nursing, then vaccinating the pigs after weaning, should give a fairly complete protection.—W. A. A.

¹Schuman, R. D.: Suggested Application of Present Knowledge for Control of Swine Erysipelas. *Proc. Book, AVMA* (1954): 90.

An Alert to Possible Ill-Effects of Synthetic Hormones

The synthetic hormone, stilbestrol, has been approved by the Federal Food and Drug Administration for use as a growth stimulant for food-producing mammals. Even though it is made available only on a carefully restricted basis in a supplement feed with directions for its proper use, it will bear watching since it still has a potential for injury. The benefits, limitations, and dangers of this potent hormone have been fairly well determined in the seventeen years since diethylstilbestrol was first produced. Like strychnine and many other agents, it is an effective, valuable drug when properly used but also can cause great harm.

Stilbestrol (15 mg.) implants have been extensively used in cockerels as a "chemical caponizer," causing for a limited period an atrophy of the gonads, a recession of male characteristics, and an increased growth rate. There has also been extensive research using this hormone as a growth

stimulant for several species of meat-producing mammals. As a result, there are many reports of remarkable growth responses without noticeable effects on the reproductive system. However, this has not been universally true. The feeding to cattle of about 0.017 mg. of the hormone per pound of body weight daily for long periods has produced excellent results, whereas implants of 15 mg. in sheep and of 120 mg. in cattle have produced undesirable estrogenic effects and deaths have resulted in sheep and swine. However, whether the variable results have been due to the preparation used, the method of use, the dosage, the type of basic ration, or the peculiarities of the individuals or species involved is for the experts to say. The rest of us are concerned primarily with the general effects.

Since adverse effects have been observed in both the research and the commercial feedlots, it apparently behooves all veterinarians to be on the alert. This applies especially to practitioners who should be prepared not only to recognize and deal with the first signs of trouble but also to give sound advice to their feeder clientele on the use and abuse of this product.

The first vital fact to consider is that estrogens occur in variable amounts in the natural feeds of livestock, particularly in growing legume plants. This is evident since animals on certain pasture forage make little growth response when given estrogens. Grazing on certain plants alone can cause great harm. A most striking example is the oft-mentioned experience in Australia several years ago, when many sheep breeders were besieged with dystocias, dead or weak lambs, everted uteri, and sterility which reduced their lamb crop to a mere fraction of the normal. The cause was proved to be the excessive estrogen content of the newly available, highly nutritious legume—subterranean clover.

Perhaps no plant raised on the North American continent approaches the danger point, but estrogens have been identified in widely varying quantities in many plants and forages, including even Spanish moss. We need more complete information on this subject so that we can better estimate how much additional hormone may be safely given to animals.

It would seem that animals on a ration including a large proportion of forage

would be in greater danger of injury than those being finished for market. The latter, especially cattle, are usually confined to a drylot and given only small quantities of roughage which often is of a relatively poor quality and, therefore, presumably would contain less estrogen. Others, especially lambs as they are often fed in the Middle-west, are allowed to range in nearby fields to utilize the available roughage. Conceivably, certain individuals (perhaps the stronger lambs as in enterotoxemia) could thus get more than their share of estrogen-rich plants and accumulate considerable quantities of the hormone.

That lower plant forms, such as molds, could also be a source of estrogen is suggested by the vulvovaginitis which has occasionally occurred when female swine are fed on moldy or spoiled corn. However, if this condition is due to an estrogen, the latter could possibly be a product of the damaged grain and not of the mold per se.

The signs of toxicity and the resulting pathological changes are apparently quite uniform for the various species. Affected milk cows have developed persistent prolapses of the rectum and vagina, nymphomania, and fractures of the pelvis. Feeding steers and heifers have shown mammary development, elevated sacrum, and even the steers have shown an estrous behavior. Male feeder lambs have died with rectums everted from straining because enlargement of the urethra and accessory sex glands has prevented micturition. (In one lot, several lambs died after receiving two 15-mg. implants at an interval of seventy days, but most of those receiving only one implant also showed discomfort and enlarged glands.)

Swine have shown little growth response to this hormone, gains even being retarded in some. Recently, in England,¹ 5 of 18 castrated male pigs were affected, 3 dying in five to eleven days after being fed daily 0.375 mg. of stilbestrol per pound of body-weight, a dosage about 20 times that recommended for cattle. (These pigs also received 0.019 mg. of thyroxine per pound of body weight, but another pig died similarly when fed only 1.2 mg. of stilbestrol per pound of body weight.) The 2 pigs which recovered were stunted.

¹Taylor, J. H., and Gordon, W. S.: The Effect of Feeding a Diet Containing Stilbestrol and Thyroxine to Growing Pigs with Special Reference to the Toxicity of Stilbestrol. *Vet. Rec.*, 67, (Jan. 15, 1955): 48.

The signs of poisoning in the pigs were anorexia, cyanosis, persistent straining, abduction of the rear limbs, tender abdomen, incontinence followed by obstruction of the urethra, swollen anal region, and everted rectum; but the temperatures remained normal.

Necropsies revealed excessive exudate in the body cavities, edema of pelvic organs, scattered hemorrhages, and an acutely inflamed bladder and urethra. A comparison with its control litter mate showed the enlargement of organs of one victim to be: heart (64%); kidneys (25%); prostate (350%); and seminal vesicles (700%). Both the meat and the urine from these pigs had an estrogenic effect when fed or injected into rats.

Careful research has indicated, at least in cattle, that apparently there is somewhat of a margin between the dose of stilbestrol which stimulates growth and that which also affects the urogenital system. As released for commercial use, this dosage is carefully regulated so we need anticipate little if any detrimental effects so long as the supplement is used as directed. Perhaps animals could not or would not eat sufficient supplement to cause trouble when the balance of their ration had an average estrogen content. However, since we can only guess at the estrogen content of a ration and since some users are almost certain to disregard directions for use of the product, we should be on the alert. While hoping for the best, should we not be prepared for the worst?

Tuberculosis Sanatorium Closes

The Trudeau Sanatorium at Saranac Lake, N. Y., the first private sanatorium for the treatment of tuberculosis, terminated its patient care facilities on Dec. 1, 1954. It was founded in 1884 by Dr. Edward L. Trudeau, a sufferer from the disease, and in seventy years has treated more than 12,000 patients. In the past forty years, the tuberculosis mortality in the United States has dropped from 140 to 12.6 per 100,000 population, although there still are about 20,000 deaths per year.—*J. Pub. Health*, Dec., 1954.

With its 12-foot stride, an ostrich can run 40 miles an hour.—*Sci. News Letter*, Feb. 12, 1955.

CURRENT LITERATURE

ABSTRACTS

Salmonellosis in Poultry in Florida

Bacteriological examination of 155 chickens which reacted to pullorum disease antigen yielded 67 (43.2%) positive for *Salmonella pullorum* and 3 (1.9%) for other *Salmonella* types. During the same period, 434 chickens and turkeys submitted for diagnosis of illness yielded 63 (14.5%) *Salmonella* organisms, of which 35 were *S. pullorum*.

Data from three poultry-processing plants revealed that of 1,244 cultures, 196 (16.0%) were positive for salmonella. The highest percentage of positive findings was from the edible viscera and the table on which edible viscera were wrapped. In addition, 507 cloacal swabs from ducks yielded *Salmonella* from 126 (24.8%). A total of 24 *Salmonella* serotypes, including one new type, were isolated from fowl and from the environment of poultry-processing plants.—(Mildred M. Galton, Don C. Mackel, A. L. Lewis, W. C. Haire, and A. V. Hardy: *Salmonellosis in Poultry and Poultry-Processing Plants in Florida*. *Am. J. Vet. Res.*, 16, (Jan., 1955): 132-137.)

Continuous Phenothiazine Therapy for Horses

A taxonomic analysis was made of the parasitic fauna in horses following four years of low-level phenothiazine administration. The species of parasites encountered were essentially the same in both treated and control animals. These observations suggested relative refractoriness to drug action by certain species of small strongyles. No action against the bots (*Gastrophilus intestinalis* and *G. nasalis*), the stomach worm (*Habronema muscae*), and the pinworms (*Oxyuris equi* and *Probstmayria vivipara*) was detected in these observations.—(J. H. Drudge, Z. N. Wyant, and G. W. Elam: *Continuous Phenothiazine Therapy for Horses. II. A Taxonomic Study Following Four Years of Treatment*. *Am. J. Vet. Res.*, 16, (Jan., 1955): 18-21.)

Anthelmintic Effect of Antimalarial Drugs

The anthelmintic effect of the antimalarial drugs atabrine, camoquin, and paludrine has been studied *in vitro*. Atabrine has been shown to stimulate *Taenia* and to inhibit the intestinal movements in dogs. Camoquin stimulated both the *Taenia* and intestines but, in larger doses, inhibited the movement of *Ascaris*. In this respect, paludrine was ineffective against *Taenia* or *Ascaris*, but in larger doses it inhibited the intestinal movements.—(A. Sharaf and I. M. Shibata: *In Vitro Studies on the Anthelmintic Effect of Some Antimalarial Drugs*. *Am. J. Vet. Res.*, 16, (Jan., 1955): 15-17.)

Plasma and Milk Tocopherol Levels of Cows and Their Foster Calves

Muscular dystrophy could not be duplicated experimentally in calves transferred to cows whose own calves had died of this disease. The average plasma tocopherol levels of the cows were 252, 244, and 233 $\mu\text{g./100 ml.}$ The average milk tocopherol levels of the cows were 41.7, 26.8, and 42.5 $\mu\text{g./100 ml.}$ in corresponding order. The newborn calves transferred to the cows had average plasma tocopherol levels, in corresponding order, of 78.6, 37.4 and 21.4 $\mu\text{g./100 ml.}$ —(J. W. Safford and Karl F. Swingle: *Plasma and Milk Tocopherol Levels of Cows Compared with the Plasma Tocopherol Levels of Their Foster Calves*. *Am. J. Vet. Res.*, 16, (Jan., 1955): 64-68.)

Vibriosis and Reproduction in Range Ewes

Data were available on the lamb production of 1,768 ewes that were present at lambing in the U. S. Sheep Experiment Station (Dubois, Idaho) flock in a year when losses from vibriosis were known to have occurred (1952) and also the following year (1953). The percentages of ewes having immature lambs in 1953 were slightly below the average percentage for the period 1940 to 1951 both in the 1,768 ewes that had been in the breeding flock in 1952 and in 692 replacement ewes added to the breeding flock the fall after the outbreak of vibriosis. The percentage of dry ewes was slightly below the long-time average. Thus, it appears that there were no losses from vibriosis the year following the outbreak.

Within breed and age groups, ewes with 1952 lambing records of no lambs ("drys"), immature lamb(s), dead lamb(s), or live lambs(s) did not differ significantly in their 1953 lamb production as evaluated by: percentage of ewes having no lambs (dry), percentage of ewes having immature lambs, percentage of ewes having dead lambs, percentage of ewes having 1 live lamb, percentage of ewes having 2 or more live lambs, percentage of live lambs born per ewe lambing, percentage of lambs weaned per ewe, or percentage of lambs weaned of live lambs born.—(Earl L. Wiggins: *The Effect of Vibriosis upon Subsequent Reproduction in Range Ewes*. *Am. J. Vet. Res.*, 16, (April, 1955): 214-216.)

Parathion in Goats

Domestic goats were treated with parathion, *p*-nitrophenyl diethyl thionophosphate, an anticholinesterase compound. The drug was given by mouth in oil, by mouth as a wettable powder, and

intramuscularly in oil. It was toxic by all routes. Red cell cholinesterase activity is not always paralleled by toxic signs in goats treated with parathion. In females poisoned with the drug, an anticholinesterase substance crosses the placental blood barrier and exerts its effect on the fetus. There is no evidence that parathion poisoning induces abortions. Parathion, or a like material, appears in the milk of poisoned goats and depresses the erythrocyte cholinesterase activity of kids fed with the milk. Severe hyperglycemia obtains in the terminal stages of chronic parathion poisoning.—[Charles G. Wilber and Roger A. Morrison: *The Physiological Action of Parathion in Goats*. *Am. J. Vet. Res.*, 16, (April, 1955): 308-313.]

Eimeria alabamensis in Cattle

Eimeria alabamensis Christensen, 1941, a coccidium of cattle, was found in 95 of 102 dairy calves on six farms. It was rare in calves 3 to 9 weeks old and common in those between 3 and 9 months of age. Young calves produced less response to inoculations than did those over 3 weeks of age. The prepatent period averaged 8.6 days, with a range of 6.0 to 11.0 days. The patent period averaged 4.6 days, with a range of 1.0 to 10.0 days. Some hosts were reinfected as many as four times before failing to respond to inoculations. Although relatively harmless under farm conditions, inoculations with high number of oocysts resulted in pathogenicity and even death in 2 of 5 calves. Severe nonfatal infections were produced in previously unexposed yearlings. Observations on sporulation changes were made. The endogenous stages were limited to intranuclear sites in the small intestine.—[Leonard R. Davis, Donald C. Boughton, and George W. Bowman: *Biology and Pathogenicity of Eimeria alabamensis* Christensen, 1941, an Intranuclear Coccidium of Cattle. *Am. J. Vet. Res.*, 16, (April, 1955): 274-281.]

Experimental Avian Histoplasmosis

The experimental inoculation of 24 chickens with the mycelial and the yeast phase of *Histoplasma capsulatum* is reported. Eight were inoculated intranasally and 15 intraperitoneally with spores of *H. capsulatum*. Packed yeast cells of *H. capsulatum* were inoculated into the heart of 1 chicken. The signs, histoplasmin skin test results, serological results, culture results, and pathological findings are recorded. *Histoplasma capsulatum* was isolated only from the chicken inoculated intracardially with the yeast phase. It died less than twenty-one hours after it was inoculated. Although the fungus was not isolated from any of the other chickens, the skin and serological tests gave some evidence that the chickens had actually been infected. Since massive doses of spores were given to 23 chickens and none showed active histoplasmosis, and since the fungus was not isolated from their organs or feces, the possibility of chickens being active carriers of the disease appears un-

likely. The chickens in these experiments were resistant to infection with two human strains and one first-passage chicken strain. Strains may be isolated or developed in the future that may be pathogenic for chickens.—[Robert W. Menges and R. T. Habermann: *Experimental Avian Histoplasmosis*. *Am. J. Vet. Res.*, 16, (April, 1955): 314-320.]

The Gametokinetic-Active Principle of Bovine Feces

Alcohol-precipitation and alumina-adsorption methods of extraction and concentration of the gametokinetic-active principle of bovine pregnancy feces have been described. Although the former gave correct positives in the male toad (*Bufo melanostictus*) tests for bovine pregnancy diagnosis, it was not considered suitable, since an increased potency was not obtained. Different adsorbents including alumina, Fuller's earth, gypsum, permutit, and silicagel were tried, but only the first was suitable. It consists of a known volume of processed acidic fecal solution (pH 3.5 to 4.0) shaken with aluminum oxide (in the proportion of 2 cc. of fecal solution:1 Gm. of alumina) for one-half hour, and then filtered. The residual alumina was again shaken for one-half hour with strong alkaline water (in the proportion of 1 Gm. of alumina:1 cc. of alkaline water) and then filtered. A faintly straw-colored solution was obtained, which was neutralized with a dilution of HCl and tested for its activity in the male toad, *Bufo melanostictus*. Of the 20 tests performed with this solution, only two false negatives were, however, recorded. Although a 90 per cent correct result was obtained, this procedure was considered better in that only a 0.5-cc. dose of the extract was sufficient to elicit a positive reaction in one-half hour. Furthermore, males of *Rana hexadactyla*, *R. limnobaris*, and *R. cyanophlyctis* were also tried for their reactivity to the alumina extract, all recording correct positives. Alumina-extraction tests were found better when compared with the routine tests in all respects, dosage, time, and nature of reaction.—[J. L. Bhaduri, R. N. Chakravarti, and N. R. Bardhan: *Extraction and Concentration of the Gametokinetic-Active Principle of Bovine Feces by Alcohol-Precipitation and Alumina-Adsorption Technique*. *Am. J. Vet. Res.*, 16, (April, 1955): 286-290.]

Visceral Leishmaniasis of a Dog in the United States

A male Doberman Pinscher brought to the United States from Greece was presented at the small animal clinic in Auburn twice in three months. He was presumably suffering from an infection which developed from a bite by another dog while he was being brought to this country. During the second hospitalization, liver biopsy showed many *Leishmania* organisms. When euthanasia was performed, this diagnosis was confirmed by spleen and liver impression smears. The organisms were cultured on a variety of mediums, and a complete histopathological study was made. The

Leishmania organisms were found in reticuloendothelial cells of the liver, spleen, kidneys, lungs, lymph nodes, skin, and connective tissue of the choroid plexus of the fourth ventricle.—[R. E. Thorson, W. S. Bailey, B. F. Hoerlein, and H. R. Seibold: A Case of Imported Visceral Leishmaniasis of a Dog in the United States. *Am. J. Trop. Med. and Hyg.*, 4, (1955): 18-22.]—RALPH E. THORSEN.

Sheep Pox Control in Egypt

Sheep pox is a serious disease in Egypt, causing high mortalities especially in lambs during winter. A sensitized vaccine had been used for many years in controlling the disease in Egypt. From the end of 1950, a desiccated live virus vaccine prepared from the Persian strain of sheep pox virus was tried. This strain was found to cross-immunize with the Egyptian virus. The vaccine gave a high titer, reaching 10^6 . The vaccinated sheep showed a medium-sized local reaction at the seat of inoculation and a mild febrile reaction. The vaccine, when used in the field on large numbers of animals of different ages and breeds, never resulted in any ill aftereffects. Half a million doses of the vaccine have been prepared to date. Immunity produced from the vaccine was found to start from the ninth day of vaccination and last for fourteen months. When used in actual outbreaks, the vaccine stopped the appearance of new cases from the eighth day after vaccination.—[M. S. Sabban: Sheep Pox and Its Control in Egypt Using a Desiccated Live Virus Vaccine. *Am. J. Vet. Res.*, 16, April, 1955): 209-213.]

Tube-Agglutination Test for Bovine Brucellosis

The majority (1,203) of the 1,333 serum samples from *Brucella abortus*, strain 19-vaccinated cattle showed a depression in Brucella agglutinin titer when the standard tube-agglutination tests were incubated at 56 C. for sixteen to twenty hours as contrasted to the titers observed when the tests were incubated at 37 C. for forty-eight hours. Very few of the serums with 1:25 to 1:50 titers at 37 C. gave evidence of agglutination at 56 C. Approximately 50 per cent of the 1:100 titers became 1:50 to incomplete at 1:100 at 56 C. Titers of 1:200 to 1:400 generally remained 1:50 or higher. At 1:800 and higher, the titers were not depressed at 56 C. Serums from cattle exposed to virulent Brucella organisms showed a definite tendency to retain titer at 56 C. This was evident even for 1:25 to 1:50 titers. These results represent 740 separate tests. A comparison of titers at 37 C. and 56 C. using serums from bacteriologically-positive and bacteriologically-negative cows showed significantly fewer titer depressions in the former group. Serums naturally containing the nonspecific Brucella-agglutinating factor of Hess and Roepke as well as normal serums fortified with the partially purified factor did not generally agglutinate Brucella antigen at 56 C. or did so at a low dilution. The problem of persistent Brucella titers in

strain 19-vaccinated cattle is discussed, and possible explanations for the results given.—[E. V. Morse, D. W. Schneider, and S. H. McNutt: The Effect of Incubation at 56 C. on the Tube-Agglutination Test for Bovine Brucellosis. *Am. J. Vet. Res.*, 16, (April, 1955): 269-273.]

FOREIGN ABSTRACTS

Seasonal Variations in Spermatogenesis of Some Farm Animals of Israel

Histological examination shows seasonal changes in the seminiferous tubules of the camel, bull, ram, and buck. With the exception of the buck, a phase of active production of spermatozoa alternates with a period of "summer sterility."

In the bull, there is some reason to believe that degeneration is brought on by response to warmer temperatures and longer days. However, vitamin A deficiency probably contributes to the continuation of this degeneration in the summer (the dry season). Regeneration does not come about during the cool months until the pasture again turns green. Goats raised in the cool mountains on vitamin-rich feed do not show the interrupted activity of the seminiferous tubules.—[R. Volcani: Seasonal Variations in Spermatogenesis of Some Farm Animals Under the Climatic Conditions of Israel. *Refuah Vet.* (Sept., 1954): 174.]—M.E.

Allergic Urticaria in Horses

The author describes a severe mangelike dermatitis, called "Queensland itch," affecting horses and mules. Most frequently affected parts are the crest, withers, back, and root of the tail, which are rubbed against walls and trees. This causes a loss of hair. Symptoms appear at the beginning of summer and disappear at the beginning of winter. It may be associated with a sensitivity, in certain horses, to the bite of an unidentified mosquito. Treatment of affected animals consists of keeping animals indoors protected from mosquitoes. Benzene hexachloride sprays seem to be useful in preventing the condition.—[E. D. Ralbag: Allergic Urticaria in Horses. *Refuah Vet.* (Sept., 1954): 167.]—M.E.

Influence of Whole Blood, Serum, or Plasma on Bull Semen

Adding 5 or 10 per cent of whole blood, 10 per cent of plasma, or 5 per cent of serum (taken from the bull providing the semen) lengthened the life span of the sperm cells and increased their motility. The most pronounced effect was obtained when the dilutor contained 5 or 10 per cent whole blood. Serum and plasma were less effective. Higher concentrations of serum and plasma reduced the activity of the sperm cells and were accompanied by the high death rate of sperm.—[R. Volcani and A. Berman: The Influence of Whole Blood, Serum, or Plasma on Bull Semen. *Refuah Vet.* (Oct., 1953): 180.]—M. E.

Contagious Mastitis in Goats

An acute purulent mastitis occurring in goats in western Georgia, U.S.S.R., is described. The morbidity was 60 per cent of the lactating animals, and about 60 per cent of affected animals died or had to be slaughtered. Sheep were not susceptible. An organism isolated from the blood, udder, and parenchymatous organs was shown to produce the disease when applied to the scarified udder. The organism was a gram-negative short rod of uncertain classification. It was related to the *Pseudomonas* group.—[A. I. Toidze, *Georgian Zoovet. Inst.: Contagious Mastitis of Goats in Georgia. Veterinariya*, 31, (July, 1954): 24-29.]—R.E.H.

Hexachlorocyclohexane in Animal Products

This insecticide (lindane,® gammexane®) was fed to cattle, sheep, horses, and swine, either directly or on forage crops dusted at the rate of 2.5 kg. per acre. The meat, fat, and milk were tested for taste, smell, and toxicity to flies, cats, dogs, and swine. When fed directly, the compound appeared rapidly in the fat and milk in quantities toxic to flies. When ingested on crops dusted in the field, enough was deposited in the fat to produce a musty odor, but not enough to be toxic to flies. The meat of animals poisoned with the compound was not toxic when fed to mammals for thirty days.—[I. N. Gladenko, *Ukrainian Vet. Exper. Sta.: The Meat Fat and Milk of Animals Receiving Hexachlorane or Feed Treated with It. Veterinariya*, 31, (July, 1954): 52-54.]—R.E.H.

BOOKS AND REPORTS

An Introduction to Molluscan Ecology

This monograph is the fourth in a series which concerns the snail hosts of schistosomes and the control of schistosomiasis. While the book deals with the biology of mollusks in general, the frame of reference is aquatic snails and the transmission of schistosomiasis in Africa.

For those interested in snails, the first chapters are most valuable. They give the general and specific requirements of aquatic mollusks, and discuss the snail populations of various aquatic environments. The later chapters will interest workers in disease control, since the rudiments of snail eradication programs are given.

As indicated in its title, this is an introduction and is intended to be only that. It is, however, elementary, and the usefulness to those working in the control of parasitic diseases is likely to be limited. Persons having little contact with ecology will gain from the discussions information on forces which can alter animal populations.—[*An Introduction to Molluscan Ecology*. By Alan Mozley. 71 pages. Illustrated. H. K. Lewis and Co., Ltd., 136 Gower St., London, W.C.1, England. Price 9s., approximately \$1.30.]—W. C. MARQUARDT.

Health Careers Guide Book

This 160-page text gives the details of 156 different occupations in all kinds of health services from hospital maintenance to creative scientific research. It is published by the National Health Council and is supported in the public interest by one of its sustaining members, the Equitable Life Assurance Society of the United States. It is being distributed without charge to more than 29,000 secondary schools and junior colleges, and it is expected that this nation-wide distribution will reach 7.5 million teenage students.

Veterinary medicine as a health career is factually presented, and the authors are to be complimented for their presentation of the facts concerning our profession. Of particular significance is the statement "Nowadays the veterinarian has the basic responsibility for keeping animals healthy and taking care of them when they are sick or injured—but he also has become a key figure in disease prevention among human beings. This is one of the newest developments in the health field, and helps explain why veterinary medicine today is a career with wide opportunities for service."

Copies of the "Health Careers Guide Book" can be obtained from the National Research Council, 1790 Broadway, New York City, N. Y.—[*Health Careers Guide Book*. By the National Health Council. 160 pages. Well illustrated. National Research Council, 1790 Broadway, New York, N.Y., 1955.]

Pathology of the Dog and Cat

The object of this book is to describe the disease changes that occur in the genitourinary organs of the dog and cat. The author is a practitioner whose interest has been in the tissue changes that have occurred in each disease process. Through this type of organized study, he has become one of the best qualified pathologists in the field of small animal diseases, which is reflected in this comprehensive presentation.

The monograph is divided into three chapters: (1) the urinary system; (2) the male genital system; and (3) the female genital system. The material is obtained from the author's own practice and from the available literature. Some of the material is presented for the first time. There are 312 illustrations made from gross and microscopic photographs which, with few exceptions, are taken from the author's own material. There are 388 references.

The presentation is concise and orderly and is highly recommended. It should have a special appeal for the veterinary student, practitioner, and pathologist. It is also an excellent reference for those interested in comparative pathology and medical research. The paper, printing, and binding are of excellent quality.—[*Pathology of the Dog and Cat*. By Frank Bloom. 463 pages. 312 illustrations. American Veterinary Publications, Inc., Evanston, Ill., 1954. Price \$12.00.]—WAYNE H. RISER.

THE NEWS

Ninety-Second Annual AVMA Convention—Minneapolis August 15-18, 1955

Plan Your Vacation in Minnesota—"Land of 10,000 Lakes"

Make Your Convention Hotel Reservations Now

Section Programs Complete for Minneapolis Meeting

The scientific programs arranged for the Ninety-Second Annual Meeting of the AVMA in Minneapolis on Aug. 15 to 18, 1955, will again combine closed-circuit television with presentations of scientific papers dealing with all aspects and phases of veterinary medicine.

The program of televised demonstrations will be presented through the courtesy of Allied Laboratories, Inc., and Radio Corporation of America, this being the fifth consecutive year these com-

panies have collaborated in making television available for AVMA meetings.

Special telecasts have been developed for the sections not previously using television (Research, Poultry, and Public Health). These demonstrations will be viewed simultaneously by the Sections meeting at that time. A total of 27 television demonstrations are planned.

The complete schedule for the six Sections is as follows:

Monday, August 15, 1:15 to 4:30 p.m.—General Practice and Research.



Campus of the University of Minnesota (Minneapolis) from the air. The Mississippi River is in the foreground.



Beautiful Minnehaha Falls in Minneapolis, immortalized in Longfellow's poem, "Song of Hiawatha." Minnehaha Park, where the falls are located, is one of the 143 parks in the city.

Tuesday, August 16, 9:00 a.m. to 12:00.—General Practice and Research.

Tuesday, August 16, 1:15 to 4:30 p.m.—General Practice, Small Animals, and Poultry.

Wednesday, August 17, 9:00 a.m. to 12:00.—Small Animals and Poultry.

Wednesday, August 17, 1:15 to 4:30 p.m.—Small Animals, Public Health, and Surgery and Obstetrics.

Thursday, August 18, 9:00 a.m. to 12:00.—Public Health and Surgery and Obstetrics.

All of the scientific meetings will be held in the Municipal Auditorium, Minneapolis.

The July JOURNAL will carry the complete program and participants.

HOTEL RESERVATIONS

All of those planning to attend the Minneapolis session are urged to make their reservations early. Hotel information and a reservation form appear in this issue (adv. pp. 46, 47) and will be printed in succeeding issues.

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"Minnesota Vacation Almanac"

In addition to the vacation resort information mentioned in the March JOURNAL (p. 243), an excellent pamphlet, "Minnesota Vacation Almanac," is available on request to the Division of Promotion, Department of Business Development, State Capitol, St. Paul 1, Minn. This almanac



Open-pit mine at Virginia, Minn.

contains a wealth of information on places of interest, fishing, scenic highway trails, state parks, camping spots, and features of the larger cities in the "Land of 10,000 Lakes."

Preconvention Conference — Sunday, August 14

The preconvention conference program at the Minneapolis meeting will be on the subject of "Veterinary Medical Examination and Licensure." An all-day session has been planned in collaboration with the National Board of Veterinary Medical Examiners. Topics such as the principles and purpose of professional licensure, methods of evaluating professional competence to practice, trends in examination procedures, the place of oral and practical tests in licensing examinations, the development and use of "objective" tests, and reports of their use by three state veterinary examining boards will be covered. Ample time will be allowed for discussion and questions.

This conference will be of special interest to members of veterinary examining boards and a wide representation of them is expected. Deans and other faculty members of veterinary schools, secretaries of veterinary medical associations, editors of veterinary publications, and all interested veterinarians are invited to attend.

The conference will be held in the Hotel Radisson beginning at 9 a.m. on Sunday, August 14.

Dr. W. G. Magrane, Research Fellow and Author

Dr. William G. Magrane, Mishawaka, Ind., who took a year's leave of absence from his practice to do graduate work as an AVMA research fellow, is the author of the article, "Vascularization—Its Significance in Diseases of the Cornea," which appears on pages 392-396 of this issue.

After receiving his D.V.M. degree at Michigan State College in 1940, Dr. Magrane went into practice with his father, Dr. Harry J. Magrane (MCK '13), in Mishawaka, where he attained a reputation as an authority on diseases of the eye. He has participated in many veterinary association programs and has written a number of valuable articles on the subject. His brother, Dr. Harry J. Magrane, II (TEX '43), joined the partnership at Mishawaka in 1943.

Upon application, Dr. Magrane was awarded his fellowship for graduate study starting in September, 1953, at the Graduate School of Medicine, Division of Ophthalmology, and at the clinics of the School of Veterinary Medicine, both at the University of Pennsylvania, Philadelphia. His academic work was finished in June, 1954, and he is now completing the clinical research in connection with his practice while preparing a thesis on canine glau-



Dr. William G. Magrane

coma. This phase of his work is under the preceptorship plan and is being guided by two American Board-certified ophthalmologists. When completed and accepted in 1956, Dr. Magrane will be granted a master's degree.

He is a member of the executive board of the American Animal Hospital Association and serves as chairman of its ophthalmology committee.

During his year in Philadelphia, he was joined by his wife and his son and daughter who attended grade school there.

Dr. Magrane was recently given an award as "veterinarian of the year" by the Gaines Dog Research Center.

Research Hospital Seeks Veterinarian

Roswell Park Memorial Institute, Buffalo, N.Y., has a position for a veterinarian who is qualified and interested in supervising the medical care of animals at the Institute and at its Springville laboratory; also, in participating in the research program. Roswell Park is a large cancer research hospital with facilities for a considerable basic science research program. The basic science research activities include several divisions and an experimental animal farm located at Springville, 25 miles south of Buffalo.

The position of the veterinarian would be in the experimental surgery department at Springville.

The position is under Civil Service, Roswell Park being under the New York State Department of Health. The grade is SG-18 with a beginning salary of \$5,090 with annual increments of \$246 up to a total of \$6,320 at the sixth year; advancement in grade, activity, and responsibility beyond this level is possible.

For detailed information, any interested veterinarian should write to Mr. Arthur A. Lepinot, Hospital Administrator, Roswell Park Memorial Institute, Buffalo 3, N. Y.



News From Washington



On March 25, 1955, the Committee on Appropriations committed to the House the Appropriations Bill (HR-5329) for the United States Department of Agriculture and Farm Credit Administration for the fiscal year ending June 30, 1956. Report 303, submitted by the committee in explanation of the bill, contained the following information pertaining to the Agricultural Research Service: appropriations (1955)—\$89,690,287; estimates (1956)—\$95,916,708; recommended (1956)—\$95,728,708.

The Committee recommended a total of **\$37,000,000 for all research in ARS**; for plant and animal disease and pest control, \$17,750,000; and for meat inspection, \$14,325,000; for the foot-and-mouth disease research program at Plum Island, \$1,900,000 is recommended.

Concerning **new research facilities**, the report stated that "Several individual projects of a major nature such as a new research laboratory at Winterhaven, Fla., and a national seed-storage facility, have been proposed by interested members for inclusion in the appropriations bill for 1956. Neither of these proposals were included in the budget by the U.S.D.A. or the Bureau of the Budget. The Committee recognizes the fine research work that has been done in Florida and realizes the need for more adequate research facilities in many areas of the country. It feels that insufficient attention has been given to a nation-wide building program and **urges the Department to make a special study of this matter** in the coming year, taking into account priority of need throughout the country and the extent to which local financial support is available. The Committee does not feel justified in initiating individual projects of a major nature in the absences of such an overall study."

The bill passed the House on March 28, and will now be considered by the Senate Committee on Appropriations.

At the request of the AVMA, Senator Young (R., N. Dak.) introduced S-1467, a

bill which, in effect, provides that **veterinarians employed by the U.S.D.A. for twenty-four months or more would not be subject to induction for the regular draft** except after a declaration of war or national emergency. This bill is an amendment to the Universal Military Training and Service Act (regular draft law), and it is hoped will be considered by the Senate Armed Services Committee when it holds hearings on HR-3005. The latter, with amendments to the present Act, extends the regular draft law from the present expiration date of June 30, 1955, to July 1, 1959.

The AVMA office has been working on **proposed legislation that would provide for voluntary social security participation** in Old Age and Survivors' Insurance by self-employed veterinarians. It is expected to have a bill introduced, probably by the time this JOURNAL is off the press, which would provide for voluntary coverage for self-employed veterinarians under the social security act. Although many amendments to the O.A.S.I. Act, passed by the 83rd Congress, have been introduced in the House, there is no evidence to date of plans to act on them during this session of the 84th Congress. Nor is action likely on the several tax-deferment annuity bills (e.g., Jenkins, Keogh, Ray, etc.) for the self-employed, which have been introduced.

Representative Riehlman (R., N.Y.) introduced House Concurrent Resolution 108, expressing the sense of the Congress that, in accordance with the Reorganization Act of 1949, **the President should create within the Department of Defense a civilian department of civil defense**. It would provide for a secretary of civil defense under the direction, authority, and control of the Secretary of Defense, transfer all functions, personnel, property, etc., to the new department, and would abolish the present Federal Civil Defense Ad-

Short Course on Electron Microscopy

The annual summer laboratory course in techniques and applications of the electron microscope will be given from June 13 to 25, 1955, under the direction of Prof. Benjamin M. Siegel. Professors Cecil E. Hall of Massachusetts Institute of Technology, Cambridge, Mass., and Robley C. Williams of the University of California, Berkeley, Calif., will be guest lecturers.

The course is designed to give members an intensive survey of basic theory and interpretation of results. The registration is limited. Address inquiries to Prof. B. M. Siegel, Department of Engineering Physics, Rockefeller Hall, Cornell University, Ithaca, N. Y.

STUDENT CHAPTER ACTIVITIES

For copy deadline, see "Among the States and Provinces"

Colorado Chapter.—The followings officers will serve the Colorado A. & M. Student Chapter of the AVMA during the spring semester: Wayne Fluke, president; Brian Hutchenson, vice-president; and Tom Carroll, secretary.

S/JACK RECHT.

Cornell Chapter.—At the February 14 meeting of the Cornell University Student Chapter of the AVMA, Dr. James H. Gillespie, of the

WASHINGTON NEWS—continued from p. 434
ministration. The resolution was referred to the House Committee on Government Operations.

HR-3297, introduced by Representative Burnside (D., W. Va.), would authorize a \$300 million program, over a five-year period, for government aid in construction of medical, dental, nursing, and other schools for education of health personnel. Half the total would be for construction of new medical schools, the other half would help finance improvement construction and facilities for existing schools in the health field. Although schools of veterinary medicine are not specifically mentioned, Section 102(3) of the bill defines the term "health profession school" as meaning any school of medicine, dentistry, public health, nursing, or other school for the education and training of health personnel, including any teaching hospital and any other facilities related to any such school.

Department of Pathology and Bacteriology, spoke about his experiences in Holland last summer.

On February 24, the following officers were elected: William Sumner, president; Martin Simensen, vice-president; Dorothy Nielsen, secretary; and Stephen Schwirck, treasurer. The speaker at this meeting was Dr. John Steele, Cortland, who discussed equine practice in New York State.

S/DOROTHY NIELSEN, Secretary.

Iowa Chapter.—One of the major highlights of the past term's activities was the annual veterinary fall banquet at which Dr. A. H. Quin, president of the AVMA, spoke on the development of veterinary medicine. Other speakers at the monthly Chapter meetings were Drs. L. Meyer Jones, professor of veterinary pharmacology at Iowa State College, School of Veterinary Medicine; F. A. Todd, assistant to the administrator, U.S.D.A.; and A. M. Orum, Carthage, Ill.

The homecoming picnic, Christmas party, and the all-college veterinary medicine ball constituted the social events of the past term.

The executive council, the governing body of the Chapter, ended its term on a pleasant note as they dined at the home of Dr. and Mrs. B. W. Kingrey. Dr. Kingrey is the faculty advisor to the Council for the year, having been elected by the Chapter last spring.

The newly elected officers are: Rex Jones, president; Bob Sharp, president-elect; Bob Gubser, vice-president; Don Wert, treasurer; Dick Houck, secretary; and John McEnaney, critic.

S/TOM K. SPENCER, Retiring Secretary.

Ontario Chapter.—At the annual banquet of the Ontario Veterinary College Student Chapter of the AVMA, R. H. Dunlop ('56) was awarded the O.V.C. Student Chapter Trophy which is presented annually to the junior stu-



Dr. J. A. Henderson (right) presenting the O.V.C. Student Chapter Trophy to R. H. Dunlop.

dent adjudged to be outstanding in sportsmanship, scholastic ability, extracurricular activities, and personality. The presentation was made by Dr. J. A. Henderson, faculty advisor for the Chapter.

s/A. H. WOOD, Secretary.

Ohio Chapter.—On the evening of February 16, the following practitioners appeared before a meeting of the University of Ohio Student Chapter of the AVMA in a question-and-answer panel: **Drs. R. W. Welbourn**, Winchester, Ind.; **J. R. Wynkoop**, Canal Winchester, Ohio; **B. S. Henson**, Shelby, Ohio; and **W. K. Wearly**, Springfield, Ohio. **Dr. Vernon L. Tharp** was moderator.

The new officers of the Chapter are: **Joe Skaggs**, president; **W. Harold Davis**, president-elect; **Jim Gabel**, vice-president; **Carl Jolley**, secretary; **John Andreas**, treasurer; and **Dr. Harold Groves**, faculty advisor.

s/W. HAROLD DAVIS, President-Elect.

WOMEN'S AUXILIARY

The Minneapolis Meeting.—It is my privilege on behalf of the Women's Auxiliary to the Minnesota Veterinary Medical Association and the Women's Activities Committee to extend to you all a most cordial invitation to come to the August AVMA meeting in Minneapolis. We are hoping this meeting will break all attendance records. Our committees have been busy working out plans for your entertainment and we hope to show everyone a memorable time.

The Curtis Hotel is headquarters for the Auxiliary and all of its meetings and some of the social functions will be there. The annual luncheon of the Auxiliary will be held at the AVMA headquarters, the Hotel Radisson. The convention meetings and exhibits, as well as registration for both men and women, will be at the Municipal Auditorium.

We are planning entertainment for teenagers and subteens, so bring the children and, after the meeting, stay for a vacation in our famous lake country. Whatever you wish for a vacation—rest, relaxation, fishing, boating, swimming, or golf—we have them all.

A word of caution—while motels and overnight cabins are plentiful, it is necessary to have reservations well in advance if you wish to spend time at our resorts. August is a popular time to vacation in Minnesota. We suggest you write immediately to the Minnesota Tourist Bureau, State Capitol, St. Paul 1, Minn., for assistance in getting the type of accommodations best suited to your needs.

While touring our state, you might include a visit to Itasca Park where the Mississippi River has its source; a trip to the Range cities with their open pit iron mines, which are the largest in the world; and a tour of Duluth

with its wonderful harbor and scenic skyline drive. A "must" for all tourists that get to Duluth is the drive up the North Shore of Lake Superior. These are only a few of our many tourist attractions.

We hope you will accept our invitation to come to the AVMA meeting in Minneapolis. We know you will have a fine time greeting old friends and making new ones. We plan to have entertainment pleasing to all.

s/(Mrs. R. A.) ALICE MERRILL,
General Chairman, Women's Activities.

Michiana Auxiliary.—Thirty members and guests of the Women's Auxiliary to the Michiana Veterinary Medical Association attended the March 10 dinner and meeting at the Hotel LaSalle in South Bend.

A high school student of South Bend, Kent Keller, gave an interesting slide illustration and talk on his experiences in Germany as an exchange student.

During the business session, several committees were appointed and the programs were planned for the coming year.

s/Mrs. L. D. RAMSEY, Secretary.

Oregon Auxiliary.—The Women's Auxiliary to the Oregon State Veterinary Association met in Portland, Jan. 29-30, 1955. The following new officers took over for the coming year: **Mrs. Austin Eivers**, Salem, president; **Mrs. J. L. Adams**, Oregon City, vice-president; **Mrs. Dennis H. DeJong**, Salem, secretary; **Mrs. K. J. Peterson**, Salem, treasurer; and **Mrs. O. H. Muth**, Corvallis, chairman of board of directors.

It was decided to send a book on veterinary medicine to the School of Veterinary Medicine, Colorado A. & M. College, in memory of the veterinarians who have passed away in recent years in Oregon.

The women voted to send contributions to the AVMA Research Fund and also to the Scholarship Fund.

s/MRS. DENNIS H. DEJONG, Secretary.

APPLICATIONS

Applicants — Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative Bylaws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., the names of applicants residing within the jurisdictional limits of the constituent associations shall be published once in the JOURNAL.

The following applicants have been certified as members of the constituent association that has jurisdiction over the area in which the applicant resides. This certification was made by the secretary of the constituent association in accordance with Section 2, Article X, of the Administrative Bylaws.

AHLERS, WILLIAM H.

95 Alpine, Dubuque, Iowa.

D.V.M., Iowa State College, 1933.

- COFFLAND, ROBERT T.
5211 E. Grant, Fresno, Calif.
D.V.M., Iowa State College, 1949.
- FEAZELL, GEORGE F.
Greenfield, Iowa.
D.V.M., Iowa State College, 1917.
- FLMING, RUSSELL G.
Alexandria, Minn.
D.V.M., Saint Joseph Veterinary College,
1916.
- GALINKO, SIDNEY
2335 Hudson Terrace, Coytesville, N. J.
D.V.M., Kansas State College, 1950.
- GRUETER, HERMAN P.
Box 31, Hooper, Neb.
D.V.M., Colorado A. & M. College, 1944.
- HAFEN, EARL G.
309 E. Laurel, Salinas, Calif.
D.V.M., Washington State College, 1949.
- HUBBARD, RICHARD C.
2265 Clark Ave., Long Beach, Calif.
D.V.M., Michigan State College, 1946.
- KNIPE, HESSER
802 19th St., Brainerd, Minn.
V.M.D., University of Pennsylvania, 1943.
- MCCUTCHEON, HAROLD B.
108 N. First St., Streator, Ill.
D.V.M., Ontario Veterinary College, 1954.
- MACHEAK, M. E.
932 Orville Ave., Kansas City, Kan.
D.V.M., Iowa State College, 1950.
- MOORE, CALVIN G.
Toledo, Iowa.
D.V.M., Iowa State College, 1912.
- NOETHE, EDWARD M.
Slayton, Minn.
D.V.M., Iowa State College, 1931.
- RILEY, CHARLES W.
1313 Douglas, Alexandria, Minn.
D.V.M., Kansas State College, 1944.
- ROLSTON, EDWIN A.
2103 Harrison Dr., Clinton, Iowa.
D.V.M., Iowa State College, 1921.
- SIEMER, C. E.
Barnum, Minn.
V.S., Ontario Veterinary College, 1916.
- STRUTHERS, HAROLD C.
P. O. Box 187, Ogema, Sask.
D.V.M., Ontario Veterinary College, 1954.
- SWINDLE, B. CONWELL
133 E. 4th St., Jacksonville, Fla.
D.V.M., Alabama Polytechnic Institute, 1940.
- WATRACH, ADOLF M.
University of Illinois, College of Veterinary
Medicine, Urbana, Ill.
M.R.C.V.S., Royal (Dick) Veterinary College,
Edinburgh, 1948.
- WAYLAND, FRANK W.
900 Monterey Rd., Salinas, Calif.
D.V.M., Washington State College, 1949.

Applicants — Not Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative Bylaws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., notice of all applications from applicants residing outside of the jurisdictional limits of the constituent associations, and members of the Armed Forces, shall be published in the JOURNAL for two successive months. The first notice shall give the applicant's full name, school, and year of graduation, post office address, and the names of his endorsers.

First Listing

- ARMSTRONG, JAMES
U.S.A.F. Field Office, Camp Detrick, Frederick, Md.
D.V.M., Cornell University, 1942.
Vouchers: W. R. Hinshaw and R. C. Fish.
- FRANCIS, CHARLES E.
Vance A. F. B., Okla.
D.V.M., Texas A. & M. College, 1954.
Vouchers: W. W. Armistead and F. P. Jaggi, Jr.
- GILRAY, J. S. A.
31 Preston Place, Toronto, Ont.
D.V.M., Ontario Veterinary College, 1954.
Vouchers: T. L. Jones and J. A. Henderson.

Second Listing

- SULLIVAN, JOHN P., 2257 Scudder, St. Paul, Minn.

1954 Graduate Applicants

The following are graduates who have recently received their veterinary degree and who have applied for AVMA membership under the provision granted in the Administrative Bylaws to members in good standing of student chapters. Applications from the 1954 senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Second Listing

University of California

- OLIVER, JOHN W., D.V.M., 1172 Minnesota Ave., San Jose, Calif.

University of Illinois

- STROMBECK, DONALD R., 80th Medical Detachment, APO 800, New York, N. Y.

Texas A. & M. College

- HULL, RICHARD A., D.V.M., Box 335, Mabank, Texas.

U. S. GOVERNMENT

Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U.S.D.A. Agricultural Research Service are reported as of March 25, 1955:

NEW APPOINTMENTS

- George R. Betsworth, Sioux City, Iowa.
Thomas L. Branigan, Lincoln, Neb.
John G. Butler, Baltimore, Md.

James H. Duke, Beltsville, Md.
Joseph Foster, Albany, N. Y.
Robert K. Hedelius, Reno, Nev.
John H. Jones, Denver, Colo.
Walter T. Juzwiak, Denver, Colo.
George W. Klover, Topeka, Kan.
Theodore Korecki, Baltimore, Md.
Wayne S. O'Neal, St. Louis, Mo.
Virgil R. Patterson, San Antonio, Texas.
Donald E. Pierz, St. Paul, Minn.
Myroslav Polotnianka, Los Angeles, Calif.
John C. Stokes, Milwaukee, Wis.
Leonard A. Thompson, Olympia, Wash.
Donald D. Tolley, Denver, Colo.
Peter E. Trainer, Raleigh, N. Car.
Algirdas Vasiukevicius, Chicago, Ill.
John B. Vaughn, Jr., Montgomery, Ala.
John J. Woolsey, Phoenix, Ariz.

DEATHS

Garner M. Jones, San Diego, Calif.
Harvey D. Lasher, Edgar, Wis.

MILITARY FURLOUGH

Donald G. McLean, Denver, Colo.

RESIGNATIONS

Leonard A. Anderson, Portland, Ore.
Richard G. Knight, Raleigh, N. Car.
George C. Sturges, Boston, Mass.

SEPARATIONS

Arturs Andermanis, Milwaukee, Wis.
Eliert H. Kartrude, Davenport, Iowa.
Janis Sprincis, Milwaukee, Wis.

SEPARATION (no return from military furlough)

Harrison S. Martin, Mexico City, Mex.

TERMINATIONS

Allen F. Hill, Augusta, Maine.
George M. Johnson, Augusta, Maine.
Walter B. Loring, Augusta, Maine.
Carl L. Martin, Augusta, Maine.

TRANSFERS

Allen S. Barnes, from Frankfort, Ky., to Charleston, W. Va.
Robert F. Batchelor, from Cheyenne, Wyo., to Washington, D. C.
Elmo M. Berroth, from Cedar Rapids, Iowa, to Chicago.
Gordon W. Blake, from Portland, Ore., to Salt Lake City, Utah.
Glen O. Fly, from Chicago, Ill., to Cedar Rapids, Iowa.
Mathias J. Kernen, Jr., from Albany, N. Y., to Montpelier, Vt.
Dale H. Legenhausen, from Beltsville, Md., to Omaha, Neb.
Jack L. London, from Mexico City, Mex., to Montgomery, Ala.
Thomas J. Matthews, from Madison, Wis., to Newark, N. J.
George J. B. Murray, from Cincinnati, Ohio, to Sioux Falls, S. Dak.
Wilbur L. Rehkemper, from Columbus, Ohio, to Frankfort, Ky.
Edward J. Wilson, from Augusta, Maine, to Baltimore, Md.

AMONG THE STATES AND PROVINCES

The deadline for News copy is the 24th of the month, two months preceding the month of issue

Alabama

Central Association.—The monthly meeting of the Central Alabama Veterinary Medical Association was held on March 3, 1955, at

Gunter Air Force Base. A social hour and dinner were followed by a business meeting and program. Plans were made for the presentation of AVMA radio scripts on the local radio stations.

Dr. John T. Scruggs, assistant director for veterinary activities, Communicable Disease Center, U. S. Public Health Service, Atlanta, Ga., discussed the relationship between the public health veterinarian and the private practitioner.

At the invitation of Lt. Col. Robert L. Hummer, president of the Association, one member of the senior class of the School of Veterinary Medicine, Alabama Polytechnic Institute, presents a paper at each meeting. **Mr. K. R. Burdette** has presented a paper on cat scratch fever and **Mr. J. T. William**, on recent advancements in the prevention of parturient paresis.

S/LLOYD J. NEURAUTER, *Chairman,*
Public Relations Committee.

Arizona

Southern Association.—The Southern Arizona Veterinary Medical Association was organized and officers were elected at a meeting on Feb. 16, 1955. Meetings will be held the third Wednesday of each month at 7:30 p.m. The officers are Drs. R. M. Carter, Tucson, president; W. J. Pistor, Tucson, vice-president; and E. T. Anderson, Tucson, secretary-treasurer. The executive board consists of Drs. A. A. Budurin, R. W. Adami, and J. L. Hinds, all of Tucson.

The constitution and bylaws provide that only members of the AVMA and Arizona State Veterinary Medical Association are eligible for membership.

S/E. T. ANDERSON, *Secretary.*

California

Southern Association.—The Southern California Veterinary Medical Association installed the following officers at the annual dinner dance at the Biltmore Hotel recently: Drs. Ross H. Hurt, Los Angeles, president; William W. Putney, North Hollywood, first vice-president; Rankin W. McIntyre, Los Angeles, second vice-president; Howard C. Taylor, Los Angeles, secretary; and Floyd P. Wilcox, Los Angeles treasurer.

The dance was attended by 175 veterinarians and their wives, and the guest of honor was **Dr. Floyd Cross**, Fort Collins, Colo., president-elect of the AVMA.

Regularly scheduled meetings are held on the third Wednesday of each month.

S/HOWARD C. TAYLOR, *Secretary.*

Canada

Contagious Diseases in Canada.—The report of the Veterinary Director General, Department of Agriculture, Canada, for the year ending

March 31, 1954, shows the incidence of the following diseases: anthrax—none; dourine—none since 1919; glanders—none since 1938; equine mange—none; sheep scab—none since 1927; cattle mange—troublesome; rabies—74 cases; hog cholera—58 herds in Ontario (3,075 slaughtered); foot-and-mouth disease—none since early 1952; Newcastle disease—because of efficacy of the vaccine, the policy of slaughter and quarantine was discontinued in March, 1954; fowl typhoid—69 flocks slaughtered but that policy also was discontinued in March, 1954.

Colorado

Conference for Veterinarians.—The sixteenth annual conference for veterinarians which was held Feb. 21-23, 1955, at the School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, was one of the largest and best in attendance and expressions of general interest to date. There were more than 300 in attendance, about 250 veterinarians and 75 wives. Eleven veterinary and surgical supply companies were represented, as were 24 states, Canada, and the Republic of the Philippines (Dr. Enrique R. Carlos). Special interest was shown in the question-and-answer luncheons held on Tuesday and Wednesday, with approximately 125 in attendance at each.

During the session, a bronze plaque was installed on the wall of the main entrance of the Glover veterinary hospital and was dedicated to the memory of Dr. George H. Glover who established the School of Veterinary Medicine at Colorado A. & M. College. At the banquet on Tuesday evening, Dean Cross announced that Dr. Rue Jensen had been appointed associate dean of the School. Mr. Joseph W. Tobiska, chemist in the Department of Pathology and Bacteriology was honored with a plaque for his years of service to the profession.

Speakers on the program were: **Drs. William L. Beer**, Aledo, Ill.; **Homer Brown**, Colorado Springs; **Victor J. Cabasso** (Sc.D.), Lederle Laboratories, Pearl River, N. Y.; **Francis R. Candlin**, Denver; **Kenneth J. Hester** and **Donald R. Mackey**, Greeley; **William Howarth**, Littleton; **Morgan K. Jarvis**, Corn States Laboratories, Inc., Omaha, Neb.; **L. S. McCandless**, Craig; **N. J. Miller**, Eaton; **George Orrell**, Steamboat Springs; **Stuart A. Patterson** (M.D.), radiologist, Fort Collins; **Paul D. Pattridge**, Golden; **Lee R. Phillips**, Lakewood; **M. N. Riemenschneider**, state veterinarian, Denver; **Wayne H. Riser**, Skokie, Ill.; **J. E. Ryff**, Laramie, Wyo.; **James D. Stewart** (M.D.), Fort Collins; **Robert R. Williams**, Caldwell, Idaho; and **Charles J. York**, Pitman-Moore Co., Indianapolis, Ind.

Those from the staff of the School of Veterinary Medicine, Colorado A. & M. College, who

participated in the program were **Drs. William D. Carlson**, **H. J. Hill**, **Rue Jensen**, **William V. Lumb**, **Bill Marden**, **L. C. Moss**, **Robert E. Pierson**, **Lee Seghetti**, and **Robert H. Udall**.

*s/O. R. Adams, Head,
Veterinary Clinics and Surgery.*

Georgia

Swine Erysipelas in Georgia.—Swine erysipelas was diagnosed in five herds in the last two months of 1954, the largest number ever encountered by the Tifton Diagnostic Laboratory in a similar period.—*Georgia Vet., Feb., 1955.*

Illinois

Illinois Cholera Vaccination Survey.—The Illinois Veterinary Medical Association Committee on Hog Cholera Eradication surveyed, by questionnaire, the methods and results of vaccination in the state in 1953. Reports from 90 practitioners covering over 1 million hogs indicated that 23 per cent were vaccinated with virulent virus and serum, 15 per cent with inactivated virus, 34 per cent with rabbit-origin modified virus vaccine, 19 per cent with porcine-origin modified virus vaccine, and 9 per cent with tissue-cultured modified virus vaccine.

The report indicated that, on a ratio basis, for every pig that died from postvaccination (6 to 15 days) reaction after the use of serum and virus, 2.58 pigs died after the use of rabbit-origin vaccine (many did not indicate if serum was used), 0.72 died following the use of porcine-origin vaccine, and 2.17 pigs died following modified tissue-culture vaccine. There was relatively little cholera in the state to challenge the immunity, but the ratio of later losses from lack of immunity was greatest for those in which vaccines of porcine origin were used and next greatest with inactivated vaccines. Of those reporting, 72 per cent believed that hog cholera can be eradicated with the vaccines now available and 63 per cent favored the discontinuance of virulent viruses.—*Illinois Vet. Bull., Jan., 1955.*

Indiana

Michiana Association.—**Dr. R. G. Schirmer**, assistant professor of surgery and medicine, School of Veterinary Medicine, Michigan State College, was guest speaker at the March 10 meeting of the Michiana Veterinary Medical Association at the Hotel LaSalle in South Bend. Seventy members and guests attended this meeting.

Dr. Ray Worley, South Bend, past chairman of the Board of the Indiana Veterinary Medical Association, gave a report on the defeated bill in the Indiana legislature proposing a veterinary school at Purdue University.

Dr. Harry Magrane, Mishawaka, present member of the board, reported on the plans of the state Association for the coming year.

Proposed plans include an area compact for veterinary schools, the establishment of a new district for northwest Indiana, and discussion of the appointment of a layman for the Livestock Sanitation Board.

S/L. D. RAMSAY, *Secretary*.
J. L. KIXMILLER, *Resident Secretary*.

Northeastern Association.—The March 8 meeting of the Northeastern Indiana Veterinary Medical Association was held in Fort Wayne.

The program, presented by several veterinarians in Fort Wayne, consisted of a film and slides showing corrective surgery for fractures and other disease conditions of small animals.

S/J. L. KIXMILLER, *Resident Secretary*.

Tenth District Association.—On March 17, the Tenth District (Ind.) Veterinary Medical Association met in Greenfield to hear Dr. W. R. Pritchard of the Veterinary Department, Purdue University, discuss mucosal diseases in cattle.

The members were entertained by a high school group which presented vaudeville acts.

S/J. L. KIXMILLER, *Resident Secretary*.

Refresher Short Course for Practitioners.—Seventeen practicing veterinarians from 17 counties in Indiana attended a five-day refresher short course on laboratory technique and diagnosis at the Veterinary Science Department, Purdue University, the week of Jan. 31-Feb. 4, 1955. The course of study included microbiology, hematology, urinalysis, toxicology, x-ray, parasitology, semen examination, physical diagnosis, and postmortem techniques. This short course is one of a number that has been conducted on and off the campus on various subjects to help the Indiana practitioners cope with animal disease problems.

S/F. A. HALL, *Extension Veterinarian*.

Iowa

Cedar Valley Association.—At the February 14 meeting of the Cedar Valley Veterinary Medical Association at Black's Tearoom in Waterloo, Dr. H. E. Biester, director of the Veterinary Research Institute at Ames, was the featured speaker. He discussed current research being conducted at the Institute, with special emphasis on hog cholera. Following his talk, a question-and-answer period was held.

S/D. A. BUCHANAN, *Secretary*.

Kansas

Old Veterinary Hospital Being Remodeled.—Remodeling of the old veterinary hospital building at Kansas State College is now under way. The building became available when the department of surgery and medicine moved into the new \$575,000 veterinary clinic. The department of physiology will occupy the first

floor, with the department of pathology on the second floor.

A ceiling will be installed in the large clinic room at the balcony level to make one large laboratory on the ground floor and two laboratories on the second floor. The two floors of the large animal wing are to be remodeled for animal research purposes. The renovation will require about eighteen months.

Massachusetts

State Association.—The regular monthly meeting of the Massachusetts Veterinary Association was held March 23 at the Hotel Beaconsfield, Boston. Dr. Francis Austin, Belchertown, discussed horsemanship and showed a motion picture on the various gaits, dressage, and other aspects of horsemanship. Dr. Irving Altman, Brooklyn, N. Y., demonstrated on a live canary, parakeet, and parrot his method of handling and treating these birds.

S/C. LAWRENCE BLAKELY, *Secretary*.

Worcester County Association.—On March 16, the Worcester County Veterinary Medical Association met at Dr. M. M. Mason's home in Worcester to hear Dr. Chester Brown, M. D., discuss abdominal surgery. The group also heard reports of the dog identification and public relations committees. Following the meeting, the group toured the new hospital of Dr. G. W. Abbott.

S/DONALD W. HEY, *Secretary*.

Michigan

Mid-State Association.—The regular monthly meeting of the Mid-State Veterinary Medical Association was held at Turney's Restaurant in Stockbridge with Dr. A. J. Spencer serving as chairman. Dr. Paul Howard, secretary of the state Association, was guest of the evening. At an earlier meeting (Feb. 3), the Association voted to serve as host for the annual meeting of the Michigan State Veterinary Medical Association on June 23-24. The following committees, with their chairmen, are planning for this meeting: general chairman, Dr. W. M. Decker; program committee, Dr. Robert Newlin; entertainment committee, Dr. Bernard Zeeb; exhibitors committee, Dr. Robert Acton; finance committee, Dr. Merlin Green; registration, Dr. A. J. Spencer; publicity, Dr. T. E. Montgomery; and arrangements, Dr. Joseph Blake.

S/ROBERT E. KADER, *Secretary*.

Missouri

Officers of State Association.—Officers for the Missouri Veterinary Medical Association for the coming year, elected at the annual meeting held at St. Louis on February 21-22, are: Drs. W. R. Sheets, Farmington, president; Wm. J. Hayden, Marshall, president-elect; Paul L. Spencer, Jefferson City, secretary-treasurer; and

Vice-Presidents Thomas M. Eagle of Kansas City; P. E. Kimball of Stanberry; and H. S. Richards of St. Louis.

• • •
Greater St. Louis Association.—The March 4 meeting of the Greater St. Louis Veterinary Medical Association was held in the French Room of the Sheraton Hotel. The guest speakers were **Dra. H. J. Osterholtz**, St. Louis, and **F. E. Carroll**, Laramie, Wyo., who discussed poultry inspection.

S/LUTHER E. FREDRICKSON, *Secretary*.

• • •
Kansas City Association.—The Kansas City Veterinary Medical Association met in the Exchange Hall, Livestock Exchange Building, on March 15. The guest speaker was **Dr. C. W. Turner**, from the University of Missouri, who discussed hormone treatment of livestock for growth, fattening, and finish. Discussion of Dr. Turner's address was led by **Dr. Jack O. Reed**, professional representative of the Syntex Animal Products Co.

S/BUSCH MEREDITH, *Secretary*.

Montana

Blackleg in Calves.—Blackleg in calves occurred at an unprecedented rate in western Montana in the eighteen months ending July 1, 1954. Losses occurred in both vaccinated and unvaccinated cattle, high in the mountains or on ranches, often where the disease had not occurred before. The age of affected animals ranged from 3 weeks up to 7 years. On a few ranches, it seems advisable to vaccinate calves before they are 3 weeks old but they must be vaccinated again at 3 or 4 months of age. Many losses occur unless all calves are again vaccinated at weaning time. The immunizing products should be held at 35 to 45 F. from manufacturing time until injected or they will diminish in potency.—*Report to Montana Livestock Sanitary Board, June 30, 1954.*

Nevada

State Association.—The annual meeting of the Nevada State Veterinary Association was held at the Hotel Thunderbird in Las Vegas on Feb. 28-March 1, 1955, with more than 30 veterinarians in attendance.

The following speakers addressed the group: **Drs. Leo Bustad**, Animal Division, Atomic Energy Commission, Richland, Wash.; **Floyd Cross**, Colorado A. & M. College, Fort Collins, president-elect of the AVMA; **N. L. McBride, Jr.**, Pasadena, Calif.; **William J. Zontine**, Lancaster, Calif.; and **E. E. Maas**, Agricultural Research Administration, Reno.

The following officers were elected for the ensuing year: **Drs. E. E. Maas**, Reno, president; **Murray H. Phillipson**, Las Vegas, vice-president; and **Edward Records**, Reno, secre-

tary-treasurer. **Drs. W. F. Fisher** and **Joseph B. Key**, Reno, were elected delegate and alternate, respectively, to the AVMA House of Representatives. **Dr. Edward Records** was recommended for appointment as resident state secretary of the AVMA.

S/EDWARD RECORDS, *Secretary*.

New Jersey

Metropolitan Association.—At the March 19 meeting of the Metropolitan New Jersey Veterinary Medical Association, **Dr. Robert B. McClelland**, of Buffalo, N. Y., discussed canine pediatrics.

S/MYRON S. ARLEIN, *Secretary*.

Ohio

Killbuck Valley Association Completes Civil Defense Training.—Members of the Killbuck Valley Veterinary Medical Association have recently completed a training program in civil defense. Sessions included instruction in first aid, special problems in handling disaster casualties, and the veterinarian's responsibilities if disaster should strike, i.e., veterinarians would have to join others in medical and allied professions in helping to treat casualties immediately following an attack; this would be followed by giving attention to the protection and care of food animals and foods. Medical, civil defense, and U. S. Department of Agriculture authorities addressed the group.

S/W. D. POUNDEN, *Associate Chairman*.

Ontario

Death of Dr. J. M. Rice.—Dr. John M. Rice (ONT '06) of London, outstanding veterinarian of western Ontario for many years, died suddenly of coronary thrombosis on Feb. 2, 1955, at the age of 71.

Born in England in 1884, Dr. Rice graduated from Ontario Veterinary college with high honors and took postgraduate work at the Royal Veterinary College and at the School of Tropical Medicine in London. He practiced in western Ontario for nineteen years and then established a small animal hospital and clinic in London.

Dr. Rice was always active in professional circles and attended many veterinary association meetings, including the Ontario Association of which he was a life member, the Canadian V.M.A., and the AVMA of which he would have been made a life member this year, having been in continuous good standing since he joined in 1911.

He is survived by his widow; a daughter; a son, **Dr. Walter M.**, graduate of Ontario Veterinary College in 1936 and now on the veterinary faculty at Oklahoma A. & M. College.

Pennsylvania

Bucks-Montgomery Association.—Members of the Bucks-Montgomery Veterinary Medical As-

sociation met at the Moose Home in Doylestown on March 9 to hear **Dr. H. Jackson Davis**, director of the Bucks County Department of Health, discuss the veterinarians' place in public health.

s/VINCENT W. RUTH, *Secretary*.

Keystone Association.—The Keystone Veterinary Medical Association met at the University of Pennsylvania, Philadelphia, on March 23. The guest speakers were **Drs. M. Shiffman**, veterinary division, Department of Public Health, City of Philadelphia, and **M. Werrin, M.D.**, also of the Department of Public Health. They discussed the many phases of veterinary public health.

s/LEONARD KRAWITZ, *President*.

Texas

Death of Hon. Wm. M. Jardine.—The Hon. William M. Jardine, 75, former secretary of agriculture of the United States (1925-1929) and honorary member of the AVMA since 1925, died recently in San Antonio, Texas, where he had made his home in recent years. Born in Idaho in 1879, he studied agriculture at the Utah Agricultural College and had a long and distinguished career in that field, some of which was spent at Kansas State College of which he was president from 1918 to 1925. He owned and operated farms in Kansas and Idaho for some years and was author of numerous papers and bulletins on agricultural subjects.

Virginia

State Association.—The fifty-eighth annual convention of the Virginia Veterinary Medical Association was held in Richmond on Jan. 23-25, 1955. A total of 164 members and guests were in attendance. At the business meeting, the Association elected the following officers: **Drs. S. G. Eddins**, Galax, president; **J. E. Lippincott**, Lynnhaven, president-elect; **J. B. Ely**, Richmond, vice-president; and **W. B. Bell**, Blacksburg, secretary-treasurer.

The literary program featured the following speakers: **Drs. C. D. Van Houweling**, U.S.D.A. Washington, D. C.; **G. R. Moore**, School of Veterinary Medicine, Michigan State College, East Lansing; **R. C. Klussendorf**, Commercial Solvents Corp., Terre Haute, Ind.; **W. F. Hoffman**, Pittsburgh, Pa.; **J. B. Currey**, Washington, D. C.; **J. V. McCahon**, Downingtown, Pa.; **J. E. Lippincott**, Lynnhaven; and **W. L. Bendix**, state veterinarian, Glen Allen.

s/WILSON B. BELL, *Secretary*.

Washington

Conference for Veterinarians.—The College of Veterinary Medicine of the State College of Washington presented its seventh annual conference for veterinarians April 4-6, 1955.

The following guest speakers appeared on

the program: **Drs. C. G. Andrist**, Chewelah; **C. M. Bemis**, Yakima; **T. L. Chow**, Colorado A. & M. College, Fort Collins; **C. L. Davis**, Agricultural Research Service, Denver, Colo.; **J. L. Ellis**, Olympia; **P. M. Hinze**, Carnation Farms, Carnation; **W. F. Irwin**, president-elect, American Animal Hospital Association, Tulsa, Okla.; **Mr. J. P. Kelley**, General Electric Co., x-ray department, Milwaukee, Wis.; **Drs. T. R. Kurtz**, Seattle; **M. O. Mulqueeney**, Sunny-side; **M. D. Nichols**, Redmond; **Mr. J. O'Connor**, editor, "Outdoor Life Magazine," Lewiston, Idaho; **A. H. Quin**, Kansas City, Mo., president of the AVMA; **S. F. Scheidy**, Sharp and Dohme, Inc., Drexel Hill, Pa.; **J. N. Shaw**, Oregon State College, Corvallis, Ore.; and **H. R. Zimet**, Moscow, Idaho.

Members of the staff of the College of Veterinary Medicine at Washington State College who participated in the program were **Drs. H. F. Beardmore**, **F. K. Bracken**, **R. D. Conrad**, **W. M. Dickson**, **R. W. Gillespie**, **R. E. Hunte**, **R. L. Ott**, **G. R. Spencer**, **J. H. Stewart**, **Dean E. C. Stone**, **Drs. F. L. Williams**, and **R. P. Worthman**.

Those in attendance enjoyed a tour of the new radiology facilities at the College, a film and discussion of an African safari, a smorgasbord, and bowling.

s/E. C. STONE, *Dean*.

State Association.—The first board meeting of the reorganized Washington State Veterinary Medical Association, Inc., on Feb. 23, 1955, was a successful one. The Association is now



This map of the State of Washington shows areas of the local associations. Each dot represents a veterinarian.

operating under the new bylaws approved at the 1954 annual meeting which provides for (Board) representation from each of the local constituent associations of the state. This is in recognition of the need for expressing veterinary organizational interest and activity at the



Officers of the reorganized Washington State Veterinary Medical Association.

Seated (left to right)—Drs. James Kraft, immediate past-president; I. Erickson, secretary; Don Clarke, president; R. I. Hostettler, president-elect; and B. Pinckney, treasurer.

Standing—Board members, Drs. Olin Anderson, Orin Swanson, Phil Millard, George Duby, Fred M. Shigley, B. D. Benedictson, Ivor Evans, and A. E. Crouse.

Absent when picture was taken, board members Drs. E. C. Stone and H. E. Beckman, Sr.

local or "grass roots" level, with the hope that this may be extended into the state Association and on to the national level. We are hopeful that the integrating and coordinating of the live-wire local associations may result in a real "forward march" for the state Association.

s/IRWIN ERICKSON, Secretary.

Personal.—Dr. Ernest H. Willers of Honolulu, who graduated in 1929, was recently selected as alumnus of the year of the College of Veterinary Medicine, State College of Washington.

STATE BOARD EXAMINATIONS

Florida—The Florida State Board of Veterinary Examiners will hold an examination on June 13-15, 1955, at the Everglades Hotel, Miami, Fla. Address inquiries to Dr. E. L. Matthews, secretary of the Board, Box 141, Palatka, Fla.

Iowa—The Iowa Veterinary Medical Examining Board will hold examinations for the licensing of veterinarians on Monday and Tuesday, June 13 and 14, 1955. Applicants are asked to be in the office of the Division of Animal Industry, State House, Des Moines, Iowa, not later than 8:00 a.m. of June 13. Anyone wishing to obtain further information should communicate with Dr. H. U. Garrett, chief, Division of Animal Industry, State House, Des Moines 19, Iowa.

Massachusetts—The Massachusetts Board of Registration in Veterinary Medicine will hold examinations for registration in Massachusetts on June 23-25, 1955, at Amherst. The

latest date for filing applications is June 10, 1955. Address inquiries to Dr. Ray S. Youmans, Secretary, Board of Registration in Veterinary Medicine, Room 33, State House, Boston, Mass.

Montana—The Montana State Board of Veterinary Medical Examiners will give an examination to approved applicants, for license to practice in Montana, on June 20 and 21, 1955, at the Montana Veterinary Research Laboratory, Bozeman, Mont. Inquiries should be addressed to Dr. J. W. Safford, Montana Veterinary Research Laboratory, Bozeman, Mont.

Ohio—The Ohio Board of Veterinary Examiners will hold examinations for the licensing of veterinarians on Tuesday and Wednesday, June 7 and 8, 1955. These examinations will be conducted in the Clinic Building, College of Veterinary Medicine, Ohio State University, Columbus, Ohio. Applicants desirous of taking the examination should be present at 8:00 a.m. on the first day. Applicants who are not graduates of Ohio State University should supply a 2- by 3-inch photograph of head and shoulders and photostatic copy of certificate of graduation. These must be in hands of the secretary not later than May 31, 1955. James R. Hay, secretary *ex officio*, Board of Veterinary Examiners, Room 709, State Office Building, Columbus 15, Ohio.

Oklahoma—The Oklahoma Board of Veterinary Medical Examiners will meet May 31-June 1, 1955, at the School of Veterinary Medicine, Oklahoma A. & M. College, Stillwater, Okla., to hold examinations and con-

sider applications for reciprocity. Dr. J. B. Corcoran, 127 N. W. 23rd St., Oklahoma City 3, Okla., secretary.

BIRTHS

Lt. (COL '54) and Mrs. John W. Ellis, Fort Bliss, Texas, announce the birth of a daughter, Terry Sue, on Feb. 10, 1955.

Dr. (COR '54) and Mrs. Edward W. Stewart, Manchester, Conn., announce the birth of a daughter, Randy Ellen, on Feb. 15, 1955.

Dr. (OSU '52) and Mrs. Eugene P. Barlage, Pandora, Ohio, announce the birth of a daughter, Karen Marie, on Feb. 19, 1955.

Dr. (UP '45) and Mrs. Robert A. Vanderhoof, Woodlake, Calif., announce the birth of a son, Frederick James, on Feb. 24, 1955.

Dr. (API '39) and Mrs. E. D. Marston, Manchester, N. H., announce the birth of their fourth child, first daughter, Amy Sue, on March 9, 1955.

Dr. (COR '51) and Mrs. Kenneth Kronman, Smithtown, N. Y., announce the birth of a son, Ross Elliot, on Feb. 2, 1955.

DEATHS

Edward F. Cary (KCV '09), 70, Seattle, Wash., died Jan. 3, 1955. Dr. Cary had been a member of the AVMA. He is survived by his widow.

Hudson Chadwick (SF '05), 78, Jackson, Miss., died Feb. 21, 1955. Dr. Chadwick had practiced in Hinds County for more than fifty years, had served as milk and meat inspector for the city of Jackson and, for eight years, as state veterinarian. In this latter capacity, he headed an effective tick eradication program. He was a lifetime member and past president of the Mississippi Veterinary Medical Association and had been a member of the AVMA.

Dr. Chadwick is survived by his widow, Mrs. Katherine Chadwick; four sons, including Charles W. (TEX '38) and Vernon D. (TEX '38), the latter of whom is now state veterinarian of Mississippi; three daughters; and twenty grandchildren.

★Harvey T. Farmer (USC '11), 68, Richmond, Va., died Feb. 19, 1955, after a brief illness. Dr. Farmer was widely known around Richmond, having practiced in that locality for more than forty years prior to his retirement in 1953. Dr. Farmer had served on the Virginia Board of Veterinary Examiners and was its secretary for a number of years. He was honored by being elected a life member to the Virginia Veterinary Medical Association in January 1954. He was also a member of the AVMA.

Dr. Farmer is survived by his widow and one son.

★George A. Frank (UP '18), 62, St. Louis, Mo., died Dec. 31, 1954. Dr. Frank was a supervisor of milk control in St. Louis. He was a member of the St. Louis Veterinary Medical Association and of the AVMA.

★W. M. Jardine, San Antonio, Texas, an honorary member of the AVMA, died recently. An obituary appears on page 442 of this JOURNAL.

★Garnet M. Jones (KCV '13), 66, Los Angeles, Calif., died Dec. 12, 1954. Dr. Jones was a member of the California State Veterinary Medical Association and of the AVMA.

Bruce D. Kennedy (ONT '11), 70, Ottawa, Ont., died Oct. 31, 1954. Dr. Kennedy had been a member of the AVMA.

Anson Knight (ONT '05), Victoria, B. C., died in October, 1952. Dr. Knight had served with the British Columbia Department of Agriculture.

Harvey D. Lasher (MCK '19), Edgar, Wis., died Feb. 20, 1955. Dr. Lasher was employed by the U.S.D.A. Agricultural Research Service.

Henry W. Leib (KVC '11), 71, Winchester, Ill., died Feb. 4, 1955. Dr. Leib had practiced in Winchester for about thirty-seven years when he retired in 1948. He was active in civic affairs and was a member of the Illinois Veterinary Medical Association.

★George C. Moffat (ONT '41), 38, Phoenix, Ariz., died March 1, 1955. Dr. Moffat, a general practitioner, had served in World War II.

G. C. Rasmussen (CVC '07), 70, Harlan, Iowa, died March 2, 1955. Dr. Rasmussen had practiced in Shelby and Audubon counties for forty-eight years. He is survived by his widow, two sons, and a daughter.

★John M. Rice (ONT '06), 71, London, Ont., died Feb. 2, 1955. An obituary appears on page 441 of this JOURNAL.

Glen H. Sharp (OSU '11), 69, Montezuma, Iowa, died March 8, 1955, after several years of ill health. Dr. Sharp, who had served for twenty-three years with the state department of agriculture, retired in 1951. He is survived by a daughter.

Henry C. Shoemaker (NYS '94), Philadelphia, Pa., died Feb. 26, 1953. Dr. Shoemaker had retired from practice.

Charles J. Sigmond (ONT '93), Pipestone, Minn., died Jan. 25, 1955. Dr. Sigmond was a general practitioner.

Wilbur C. Smith (ISC '09), Fairfield, Iowa, died Oct. 8, 1954. Dr. Smith served with the U. S. Bureau of Animal Industry.

Allen G. Stamford (GR '11), 71, Clay City, Ill., died Nov. 2, 1954. Dr. Stamford is survived by his widow.

Frank W. Tarnow (UP '29), 53, Mercersburg, Pa., died July 5, 1954. Dr. Tarnow had been a member of the AVMA.

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COMING MEETINGS

Notices of Coming Meetings must be received by 4th of month preceding date of issue

- American Animal Hospital Association. Annual meeting. Hotel Statler, Detroit, Mich., May 4-7, 1955. Wayne H. Riser, Skokie, Ill., executive secretary.
- Eastern Iowa Veterinary Association, Inc. Annual all-day practitioners' clinic. Hawkeye Downs, Cedar Rapids, Iowa, Tuesday, May 10, 1955. Robert E. Savage, Monticello, Iowa.
- Pennsylvania, University of. Symposium on Helminthic Problems in Veterinary Medicine. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., May 10, 1955, beginning at 9:00 a.m. John E. Martin, assistant professor of physiology and pharmacy.
- Georgia Veterinary Medical Association. Annual meeting. Biltmore Hotel, Atlanta, Ga., May 29-31, 1955. Chas. C. Rife, 420 Edgewood Ave., N.E., Atlanta, Ga., secretary.
- Texas, A. & M. College of. Conference for veterinarians. Memorial Student Center, College Campus, College Station, Texas, June 2-3, 1955. Alvin A. Price, chairman.
- Kansas State College School of Veterinary Medicine. Golden anniversary and dedication ceremonies of the new veterinary hospital, June 2; and the annual conference for veterinarians, June 3-4, 1955, at the new veterinary hospital. E. E. Leasure, dean.
- Wyoming Veterinary Medical Association. Annual meeting. Casper, Wyo., June 12-13, 1955. John F. Ryff, P.O. Box 960, Laramie, Wyo., secretary.
- Montana Veterinary Medical Association. Annual meeting. Great Falls, Mont., June 15-17, 1955. E. A. Tunnicliff, Agriculture Experiment Station, Bozeman, Mont., secretary.
- Alberta Veterinary Medical Association. Annual meeting. Palliser Hotel, Calgary, Alta., June 17-18, 1955. H. C. Storey, 834-13th Ave. West, Calgary, Alta., chairman, publicity committee.
- South Carolina Veterinary Medical Association. Summer meeting. Columbia, S. Car., June 17-18, 1955. R. W. Beaty, Jr., P.O. Box 1270, Sumter, S. Car., secretary.
- Utah Veterinary Medical Association. Annual meeting. Ogden, Utah, June 20-22, 1955. E. A. Tugaw, 3015 S. State St., Salt Lake City, Utah, secretary.
- North Carolina State Veterinary Medical Association. Annual meeting. Kitty Hotel, Wrightsville Beach, N. Car., June 21-22, 1955. Clyde W. Young, Mocksville, N. Car., secretary.
- Maryland State Veterinary Medical Association. Summer meeting. George Washington Hotel, Ocean City, Md., June 23-24, 1955. John D. Gadd, Cockeysville, Md., secretary.
- Michigan State Veterinary Medical Association. Annual meeting. Hayes Hotel, Jackson, Mich., June 23-24, 1955. Paul V. Howard, 4011 Hunsberger St. N.E., Grand Rapids 5, Mich., secretary.
- Idaho Veterinary Medical Association. Annual meeting. McCall, Idaho, June 23-25, 1955. A. P. Schneider, 2025 N. 23rd St., Boise, Idaho, secretary.
- Maritime Veterinary Associations. Joint conference. Mount Allison University, Sackville, N. B., June 28-30, 1955. J. F. Frank, Sackville, N. B., secretary, joint committee.
- Mississippi State Veterinary Medical Association. Annual meeting. Buena Vista Hotel, Biloxi, Miss., July 10-12, 1955. Charles H. Horne, Newton, Miss., secretary.
- Kentucky Veterinary Medical Association. Summer meeting. Seelbach Hotel, Louisville, Ky., July 20-21, 1955. R. J. Ausherman, 171 N. Upper St., Lexington, Ky., secretary.
- Alabama, Conference for Veterinarians. School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, Ala., July 24-27, 1955. R. S. Sugg, dean.
- American Veterinary Medical Association. Annual meeting. Municipal Auditorium, Minneapolis, Minn., Aug. 15-18, 1955. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.
- Louisiana Veterinary Medical Association, Inc. Annual meeting. Washington Youree and Captain Shreve Hotels, Shreveport, La., Aug. 24-25, 1955. R. B. Lank, Baton Rouge, La., secretary.
- Colorado Veterinary Medical Association. Annual meeting. Steamboat Springs, Colo., Sept. 14-16, 1955. Walter R. Haas, Eaton, Colo., secretary.
- New York State Veterinary Medical Society. Annual meeting. Hotel Statler, New York, N. Y., Sept. 14-16, 1955. Joan S. Halat, 803

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(Continued on p. 28)

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Oklahoma A. & M. College. Conference for veterinarians. School of Veterinary Medicine, Oklahoma A. & M. College, Stillwater, Okla., Sept. 29-30, 1955. J. D. Friend, Department of Veterinary Anatomy, chairman.

New England Veterinary Medical Association. Annual meeting. Poland Springs House, Poland Springs, Maine, Oct. 2-5, 1955. C. Lawrence Blakely, 180 Longwood Ave., Boston, Mass., secretary.

Eastern Iowa Veterinary Medical Association, Inc. Annual meeting. Hotel Montrose, Cedar Rapids, Iowa, Oct. 13-14, 1955. Wayne H. Thompson, Earlville, Iowa, secretary.

U. S. Livestock Sanitary Association. Annual meeting. Jung Hotel, New Orleans, La., Nov. 16-18, 1955. R. A. Hendershott, 1 W. State St., Trenton 8, N. J., secretary.

Foreign Meetings

Seventh International Congress of Comparative Pathology. Institute of Pathological Anatomy, Lausanne, Switzerland, May 26-31, 1955. The General Secretary, 19 Rue César-Roux, Lausanne, Switzerland. (Dr. Lee M. Hutchins, Division of Forest Disease Research, Forest Service, U.S.D.A., Washington 25, D. C., chairman, United States Section of the Congress.)

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Third International Congress of Biochemistry. Brussels, Belgium, Aug. 1-6, 1955. Claude Liebecq, 17 Place Delcour, Liege, Belgium, secretary general.

Regularly Scheduled Meetings

Atlanta (Ga.) Veterinary Society, the second Tuesday of every month at the Elks Home on Peachtree St., Atlanta, Ga. J. L. Christopher, Smyrna, Ga., secretary.

Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m. at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Harry L. Schultz, Jr., 9011 Harford Rd., Baltimore, Md., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of each month. E. Paul, Redwood City, Calif., secretary.

Cedar Valley Veterinary Association, the second Monday of each month, except January, July, August, and October, at Black's Tea Room, Waterloo, Iowa. D. A. Buchanan, Grundy Center, Iowa, secretary.

Central Alabama Veterinary Association, the first Thursday of each month. G. J. Phelps, Jr., Montgomery, Ala., secretary.

Central Arizona Veterinary Medical Association, the second Tuesday of each month. F. R. Benton, 302 South Country Club Dr., Mesa, Ariz., secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Herbert Piper, 4575 Ventura Ave., Fresno, Calif., secretary.

Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel in Greensboro, N. Car. R. T. Copeland, 1800 Walker Ave., Greensboro, N. Car., secretary.

Central Indiana Veterinary Medical Association, the second Wednesday of each month. Charles J. York, P. O. Box 1656, Indianapolis 6, Ind., secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month. Mark E. Davenport, Jr., 215 S. Edgewood Ave., LaGrange, Ill., secretary.

Coastal Bend (Texas) Veterinary Association, the second Wednesday of each month. J. Marvin Prewitt, 4141 Lexington Blvd., Corpus Christi, Texas, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. D. I. Lee, Sac City, Iowa, secretary.

Cuyahoga County (Cleveland, Ohio) Veterinary Medical Association, the first Wednesday of each month, September through May (except

(Continued on p. 30)

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January), at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Ed. R. Jacobs, 5522 Pearl Rd., Cleveland, Ohio, secretary.

East Bay (Calif.) Veterinary Medical Association, bimonthly, the fourth Wednesday. John T. Turver, 1201 E. 12th St., Oakland 6, Calif., secretary.

Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. A one-day clinic is held in May. R. P. Link, College of Veterinary Medicine, University of Illinois, Urbana, Ill., secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month. John D. Baker, Goldsboro, N. Car., secretary.

Fayette County Veterinary Association, Iowa, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Greater St. Louis (Mo.) Veterinary Medical Association, the first Friday of the month (except July and August) at the Sheraton Hotel, Spring Ave. and Lindell Blvd. Luther E. Fredrickson, Room 25, Municipal Courts Bldg., St. Louis, Mo., secretary.

Jacksonville (Fla.) Veterinary Medical Association, the second Thursday of each month, time and place specified monthly. L. D. Barrett, Rt. 8, Box 572, Jacksonville, Fla., secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month, in Louisville or within a radius of 50 miles. Dr. W. E. Bewley, P.O. Box "H", Crestwood, Ky., secretary.

Kansas City Small Animal Hospital Association, the first Monday of each month, at alternating hospitals. W. F. Noland, 7504 Metcalf, Overland Park, Kan., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month at Exchange Hall, ninth floor, Livestock Exchange Bldg., 1600 Genessee St., Kansas City, Mo. Busch Meredith, 800 Woodwether Rd., Kansas City 5, Mo., secretary.

Kern County (Calif.) Veterinary Medical Association, the first Thursday of each month. W. W. Stiern, 17 Niles St., Bakersfield, Calif., secretary.

Keystone (Pa.) Veterinary Medical Association, the fourth Wednesday of each month at the University of Pennsylvania School of Veterinary Medicine, 39th and Woodland Ave., Philadelphia 4, Pa. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.

Kyowva (Ky., Ohio, W. Va.) Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Harry J. Fallon, 200 5th St. W., Huntington, W. Va.

(Continued on p. 32)

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Michiana Veterinary Medical Association, the second Thursday of each month, at the Hotel LaSalle, South Bend, Ind. L. D. Ramsay, 719 E. Jefferson Ave., La Porte, Ind., secretary.

Michigan, Southeastern Veterinary Medical Association, the second Thursday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Road, Detroit 5, Mich., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. George McCollister, 2146 Broad St., San Luis Obispo, Calif., secretary.

Mid-State (Mich.) Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert E. Kader, 5034 Armstrong Rd., Lansing 17, Mich., secretary.

Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. George F. Lynch, 201 West Devon St., Milwaukee 17, Wis., secretary.

Monterey Bay Area (Calif.) Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 90 Corral de Tierra, Salinas, Calif., secretary.

New Castle County (Del.) Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. Arthur P. Coogan, 2102 New Road, Wilmington 5, Del., secretary.

New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Wisneslick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northern Colorado Veterinary Medical Society, the second Monday of each month. William H. Beckenhauer, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday of each month at the Casa Mana in Teanek, N. J. Edward Baker, 568 Grand Ave., Englewood, N. J., secretary.

(Continued on p. 54)

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Northern San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. Ernest Makino, Patterson, Calif., secretary.

Oklahoma County Veterinary Medical Association, the second Wednesday of every month except July and August. Carl L. Clark, 127 N. W. 23rd St., Oklahoma City, Okla., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month at 8:00 p.m. in Antlers Hotel, San Bernardino, Calif. Jay C. Wallis, 112 N. Girard St., Hemet, Calif., secretary.

Orange County (Calif.) Veterinary Medical Association, the third Thursday of each month. Donald E. Lind, 2643 N. Main St., Santa Ana, Calif., secretary.

Peninsula (Calif.) Veterinary Medical Association, the third Monday of each month. T. D. Harris, San Mateo, Calif., secretary.

Piedmont (N. Car.) Veterinary Medical Association, the last Friday of each month at 7:00 p.m. in Mull's Motel in Hickory, N. Car. W. W. Dickson, Box 1071, Gastonia, N. Car., secretary.

Pima County (Ariz.) Veterinary Medical Association, the third Wednesday of each month in Tucson. E. T. Anderson, 8420 Tanque Verde Rd., Tucson, Ariz., secretary.

Redwood Empire (Calif.) Veterinary Medical Association, the third Thursday of each month. Robert E. Clark, Napa, Calif., secretary.

Sacramento Valley (Calif.) Veterinary Medical Association, the second Wednesday of each month. W. E. Steinmetz, 4227 Freeport Blvd., Sacramento, Calif., secretary.

Saginaw Valley (Mich.) Veterinary Medical Association, the last Wednesday of each month. S. Correll, Rt. 1, Midland, Mich., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month except July and August. E. R. Quortrup, 4005 Rosecrans St., Building 2, San Diego, Calif., secretary.

San Fernando Valley (Calif.) Veterinary Medical Association, the second Friday of each month at Eaton's Restaurant in Studio City, Calif. R. A. Button, 5954 Van Nuys Blvd., Van Nuys, Calif., secretary.

Seattle Veterinary Medical Association, the third Tuesday of each month in the Trinity Episcopal Church, 8th and James St., Seattle, Wash. P. R. Des Rosiers, 5508 2nd Ave. N. W., Seattle 7, Wash., secretary.

Southeastern (Mich.) Veterinary Medical Association

(Continued on p. 36)

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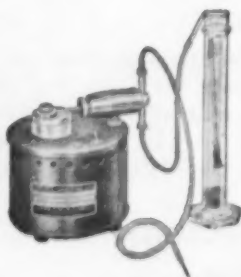
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(COMING MEETINGS—continued from p. 34)

ciation, the fourth Wednesday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Rd., Detroit 5, Mich., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. E. T. Anderson, Rt. 2, Box 697, Tucson, Ariz., secretary.

Southern California Veterinary Medical Association, the third Wednesday of each month. Howard C. Taylor, 2811 West Olive St., Burbank, Calif., secretary.

South Florida Veterinary Society, the third Tuesday of each month, at the Seven Seas Restaurant, Miami, Fla. J. C. Matlock, 4561 Ponce DeLeon Blvd., Coral Gables, Fla., secretary.

South Puget Sound (Wash.) Veterinary Medical Association, the second Thursday of each month except July and August. Jo Walker, Agriculture Experiment Station, Puyallup, Wash., secretary.

Tenth District (Ind.) Veterinary Medical Association the third Thursday of each month. W. E. Sharp, Union City, Ind., secretary.

Tulsa (Okla.) Veterinary Medical Association, the third Thursday of each month in Directors' Parlor of the Brookside State Bank, Tulsa, Okla. Merle S. Watts, 5302 E. 11th St., Tulsa, Okla., secretary.

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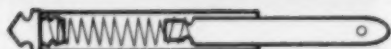
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*Jonas, Self-Retaining Medullary Extension Splint, J.A.V.M.A., 124, (1954) pp436-440; Proceedings Book, A.V.M.A. Convention 1954, pp270-275. Patent No. 2,672,861



Tibia. Assembled splint in longer fragment. Cotterpin holds compressed spring and pin in sleeve.



Splint extended. Cotterpin withdrawn, pin projected into shorter fragment of tibia.

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(Continued on p. 40)

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(CLASSIFIED ADS—continued from p. 38)

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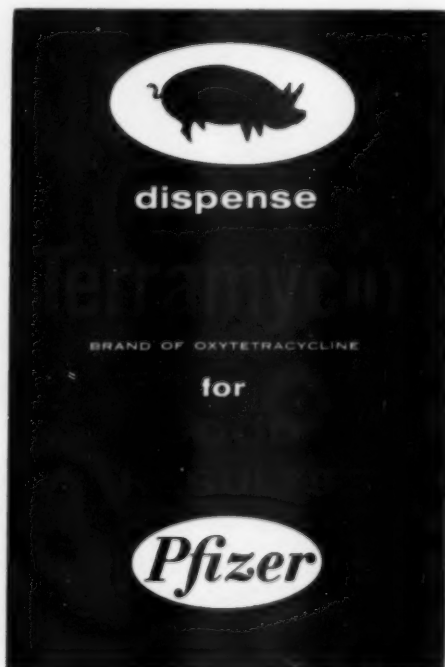
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Assistant veterinarian wanted in busy mixed practice in the Southwest. June graduates will be considered. Address "Box M 18," c/o JOURNAL of the AVMA.

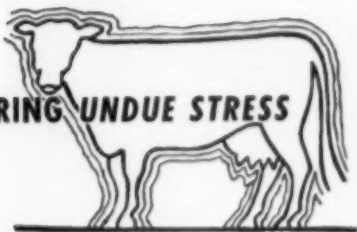
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(Continued on p. 42)



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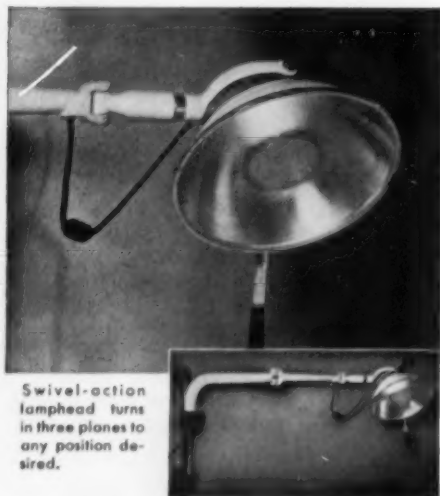
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520 N. Michigan Ave., Chicago 11, Ill.



Swivel-action lamphead turns in three planes to any position desired.

Jointed arm link puts light well out over table, attaches to wall.

"Any-angle" Light makes your work easier

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Lighted work field is large, to make seeing easier if animal moves. Light is cool, color-corrected, of just the right intensity—for better vision.

To see how Castle's Veterinary Light and other equipment can make your work easier, mail coupon below.

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1866 E. Henrietta Rd., Rochester, N.Y.

☐ Please send free folder on how Castle equipment can help improve my hospital.

Name _____

Street _____

City _____

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My veterinary supply dealer is: _____

Castle LIGHTS AND STERILIZERS

(CLASSIFIED ADS—continued from p. 40)

Veterinarian wanted, man or woman, as assistant in small animal practice in Michigan. Give full particulars in reply including draft status, age, health, and salary expected. Address "Box M 19," c/o JOURNAL of the AVMA.

Assistant wanted for small animal practice with arrangements for sale whenever desired; 80-cage brick hospital, adjacent two-story residence. In Pennsylvania city of 100,000. Advantageous terms for financing sale. Address "Box M 26," c/o JOURNAL of the AVMA.

Remittance must accompany advertisement

Veterinarian wanted to assist in small animal practice; Virginia license required. State qualifications in first letter. Address "Box M 23," c/o JOURNAL of the AVMA.

Wanted—Positions

Veterinarian, small animal and research experience, desires association with progressive small animal hospital. Licensed in California and Nevada; age 28. Address "Box L 17," c/o JOURNAL of the AVMA.

Recent graduate of approved school desires position as assistant to progressive small animal practitioner in California; preferably leading to partnership or purchase of practice. Married, licensed; to be discharged from Army in September, 1955. Address "Box M 6," c/o JOURNAL of the AVMA.

(Continued on p. 44)

VETERINARY WRITER WANTED

Advertising agency, specializing in medical and veterinary promotion, wants someone who is:

- 1) experienced in writing clear and interesting veterinary material,
- 2) familiar with the methods and problems of the veterinary practitioner,
- 3) interested in living in the New York metropolitan area.

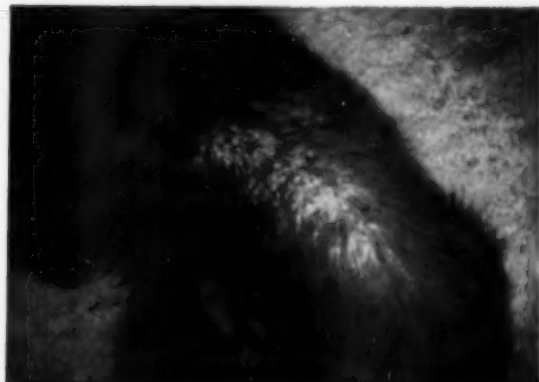
To apply, send a letter including personal and professional history, reprints of published material, salary desired.

All material will be kept confidential and promptly returned.

Address "Box M 31," JOURNAL OF THE AVMA, 600 S. Michigan Ave., Chicago 5, Ill.

here's how **SELEEN**[®]

controls nonspecific dermatoses



Before SELEEN—persistent dermatitis of 2 years' duration. Note lesions and areas without hair on back of dog. All previous treatments with various medications were ineffective or gave temporary results.

After SELEEN—two weeks after 3rd treatment. Skin is again normally healthy, hair has grown back and regained glossy appearance. First treatment controlled redness and itching.



You can expect results like these with SELEEN—for both dogs and cats:

completely controls 87%—definitely improves 98% of cases.

relieves itching, scratching and redness—often in one treatment.

kills ectoparasites—including fleas, lice and demodex mange mites.

cleanses skin and haircoat, removes dead tissue scales.

gives hair a healthier, glossier appearance.

Often effective where other treatment fails, SELEEN is easy, safe to use. Like a shampoo, it lathers fast . . . rinses easily . . . takes only 10-15 minutes per treatment. Non-toxic SELEEN has a pleasant odor, causes no carpet or furniture stains.

Ethically distributed, SELEEN is available to veterinarians only. In 6-fluidounce, pint and economical gallon bottles. *Abbott*

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\$164.60

5 Compartment Stalls FORMERLY \$179.90

Waterproof. Heavily galvanized sheets. 1½" angle iron frames braced and welded. 1" pipe door frames with dog-proof mesh. Completely assembled. Satisfaction guaranteed.



KENNEL **RUNS**

DOUBLE FRAMED

Exclusive, patented Ford Double Frame construction guarantees safety and long service. Galvanized chain link is rust-resistant. No tie wires to rust. Sections clamp easily together.

WRITE for Literature and Prices on
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KENNEL EQUIPMENT

109 D W. 21ST. ST. INDIANAPOLIS, IND.

Graduate (1953) of the Veterinary College, Giesen, Germany, (graduates of this year are recommended by AVMA for recognition by State Boards and other agencies) desires position with pharmaceutical establishment or as an assistant in general practice in any part of the country. Experienced in bacteriology and artificial insemination. Has first citizenship papers. Speaks English, age 26, married. Address "Box M 5," c/o JOURNAL of the AVMA.

Veterinarian, licensed in Pennsylvania and New Jersey, desires position as assistant in small animal hospital in either state. Graduate, 1954, AVMA-approved school; married, 25. Address "Box M 12," c/o JOURNAL of the AVMA.

Experienced large animal practitioner in Middle-west desires assistantship or partnership in busy practice. Age 36, married, capable and dependable. Prefer community with Roman Catholic schools. Address "Box M 2," c/o JOURNAL of the AVMA.

Graduate of approved school with extensive experience in small animal practice desires position with practitioner or commercial company. Excellent personality, nice appearance, age 35. Licensed in Florida and Alabama. Prefer southern location or Arizona. Address "Box M 25," c/o JOURNAL of the AVMA.

Experienced relief veterinarian available; small animals only. New York and New Jersey licenses. Address D.V.M., 1007 80th St., North Bergen, N.J.

Wanted—Practices

Small animal hospital wanted, Florida south coast; have Florida license. Will buy, lease, rent, or work as assistant. Experienced. Address "Box M 4," c/o JOURNAL of the AVMA.

Veterinarian with two years of experience desires to purchase or lease, with option to buy, small animal hospital. Will consider partnership. Licensed in Massachusetts, Connecticut, and Michigan. Address "Box M 8," c/o JOURNAL of the AVMA.

Qualified veteran has substantial down payment to buy small animal hospital in California or will lease or accept position leading to partnership or purchase. Address "Box M 16," c/o JOURNAL of the AVMA.

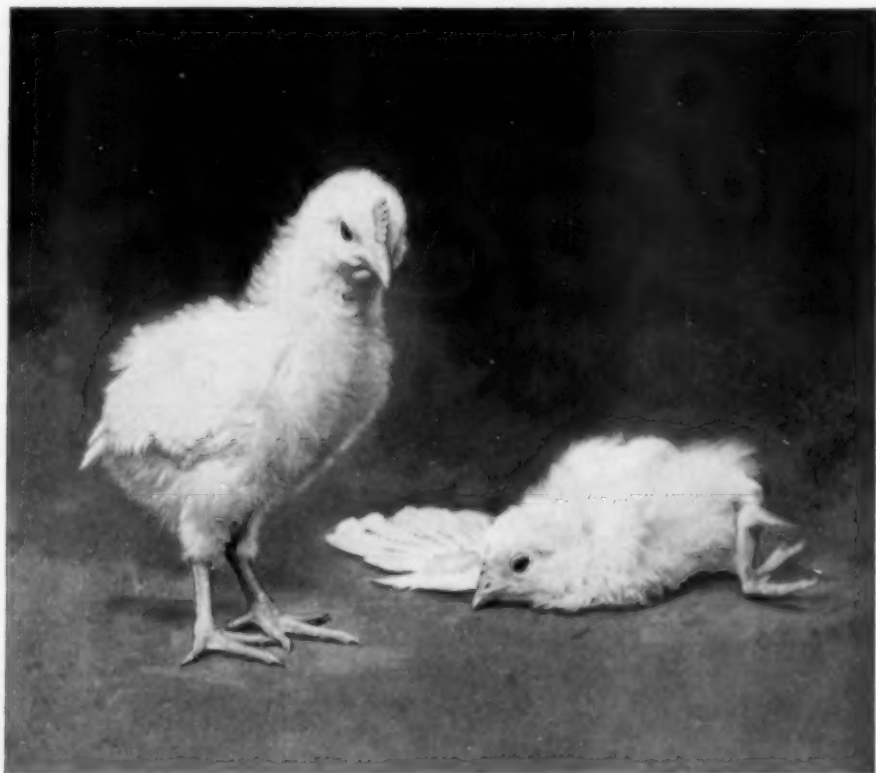
Want to purchase small animal practice in New York State. Can make substantial down payment. Give full particulars in first letter. Address "Box M 24," c/o JOURNAL of the AVMA.

For Sale or Lease—Practices

Established mixed practice for sale or lease; predominantly dairy. Located in excellent central Oklahoma livestock area. New modern five-room hospital. Excellent opportunity. Address "Box J 23," c/o JOURNAL of the AVMA.

General practice for sale in New Jersey dairy country; good opportunity for small animal practice; five-room small animal hospital, eight-room house. Health a factor in selling. Address "Box M 21," c/o JOURNAL of the AVMA.

(Continued on p. 60)



Only the kind of Phosphorus was different

THESE 2-week-old chicks were fed identical diets — only the *source* of the phosphorus differed. The graphic results, shown here, help explain why constant checks on biological availability are considered so important at International's research laboratory...and are a part of the standard procedure.

All phosphorus sources are continuously compared for *usability* by poultry and livestock. Running control is kept of every International Minerals' product — a unique program in the industry which supplies feed ingredients.

This thorough and long-standing research has resulted in significant benefits to the feeder. They include the development of new feed phosphorus products which are 2 to 4 times more effective nutritionally than some sources previously used. Today, these products provide feed manufacturers with "harder working" phosphates to meet the stepped-up needs of modern poultry and livestock production.

"Through research
more dynamic feed
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HOTEL RESERVATIONS — MINNEAPOLIS CONVENTION

Ninety-Second Annual AVMA Meeting, Aug. 15-18, 1955

All requests for hotel accommodations will be handled by a Housing Bureau in cooperation with the Committee on Local Arrangements. The Bureau will clear all requests and confirm reservations.

HOTELS AND RATES

HOTEL	SINGLE	DOUBLE	TWIN BEDS
1. Andrews	\$4.00-6.50	\$5.75-9.50	\$7.00-10.00
2. Anthony	\$3.25-4.50	\$4.50-6.50	\$6.00-8.00
3. Camfield	\$3.50-5.00	\$4.50-6.00	\$6.00-8.00
4. Continental	\$4.00	\$5.00	\$6.00
5. Curtis	\$5.00-6.50	\$6.50-8.00	\$8.50-11.00
6. Dyckman	\$4.00-7.50	\$7.00-11.50	\$8.00-12.50
7. Francis Drake	\$5.00-8.00	\$6.50-9.00	\$8.50-10.50
8. Hampshire Arms	\$3.50-4.50	\$5.00-6.00	\$6.00-7.50
9. Harmon	\$3.50	\$4.50	\$6.00
10. Hastings	\$3.50-5.00	\$6.00-7.00	\$8.00
11. Leamington	\$6.00-12.00	\$8.00-14.00	\$9.50-16.00
12. Minnesota	\$3.50-5.25	\$5.00-7.00	\$7.00-8.00
13. Nicolle	\$5.50-10.50	\$8.50-14.00	\$9.00-14.00
14. Nordic	\$4.00	\$5.00-6.00	\$7.00
15. Normandy	\$5.00-7.00	\$7.50-8.00	\$9.00-10.00
16. Sheridan	\$4.50-5.50	\$6.00-7.00	\$8.00
17. Stone	\$3.25	\$5.00	\$6.00
18. Vendome	\$3.00-4.00	\$4.50-5.50	\$5.50-6.00

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HOTEL RESERVATION FORM — AVMA CONVENTION — MINNEAPOLIS

To: HOUSING BUREAU

Minneapolis Convention and Visitors Bureau
1750 Hennepin Avenue
Minneapolis, Minn.

Please make reservations indicated below:

_____ Single room(s) at \$ _____
 _____ Double bed rooms at \$ _____
 _____ Twin-bed rooms at \$ _____
 _____ Suite (specify type of accommodations wanted)

(Three choices MUST Be Shown)

First choice hotel _____

Second choice hotel _____

Third choice hotel _____

Arriving on (date) _____ at _____ a.m. _____ p.m.

Leaving on (date) _____ at _____ a.m. _____ p.m.

Room will be occupied by (attach list of additional names if necessary).

Your Name (Print or Type) _____

Street Address _____ City and State or Province _____

Bovine and Equine Safety

MOUTH SPECULUM

- Safety locking feature withstands 800 lbs pressure.
- Allows adequate room for inserting arm from either side.
- Attachment available for passing stomach tube through mouth makes this operation simpler and more humane.



Price **\$57.50** POST For stomach tube
PAID attachment add \$13

Sold to veterinarians only by makers of famous MacAllan Ear-Cropping Forms. Send check or money order, or phone Lansing 2-3797.

MACALLAN LABORATORIES
Route No. 2, Box 420
Lansing, Michigan

NEW 'Antilepto'

LEPTOSPIRA BACTERIN

*New, improved immunizing agent
against bovine leptospirosis*

MAJOR ADVANTAGES: High protective titers developed within 7 days. Protection lasts at least 6 months.¹ Stable, potent.

Annual losses from bovine leptospirosis are estimated at over 112 million dollars—25 million dollars greater than losses from bovine brucellosis.² With new 'ANTILEPTO', semi-annual vaccination of beef and dairy cattle will control the spread of the disease—check losses in animals and milk.

Available exclusively to licensed veterinarians.

Supplied: 25-cc. (5-dose) and 100-cc. (20-dose) vials.

References: 1. Brown, A. L., et al.: To be published. 2. Agricultural Research Service, Losses in Agriculture, June 1954, Table 20, p. 129.



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DIVISION OF MERCK & CO., INC.

Correspondence

More Letters of Appreciation

Recent weeks have brought letters from a number of members accorded Life Membership in the AVMA and who were recently sent a permanent (plasticized) membership card. Space permits only excerpts from these letters.

As the years go by I read the JOURNAL with increasing interest and am happy to note the contributions from the "youngsters." They will keep up the good work.

s/John Barger,
Henderson Point,
Pass Christian, Miss.

My appreciation for this recognition is beyond words.

s/James W. Benner,
State College, N. M.

Am now past my seventy-fourth birthday and entirely inactive with a rather small income, so it is very much appreciated.

s/Chas. B. Breining,
Easton, Md.

This honor is indeed appreciated and I look forward with a great deal of pleasure each month to receiving the JOURNAL.

s/Bert J. Cady,
East Winthrop, Maine.

I feel honored in having the card. Its intrinsic value is appreciated also, as living on the old-time pension is a much over-rated pastime! I was at the retirement party of the second of my successors as Veterinary Director General only yesterday, so time passes.

s/A. E. Cameron,
231 Sunnyside Ave.,
Ottawa, Ont.

I greatly appreciate this courtesy. If I can be of any assistance, please call on me.

s/A. B. Crawford,
4707 Connecticut Ave.,
Washington 8, D. C.

(Continued on p. 50)

Send for **FREE** 36-page Tract on
CARROT OIL VITAMINS

Details the advantages of carrot oil vitamins when used in feeds to improve breeding results; to destroy oxidized milk flavors; and to promote general good health and glossy coats. Contains much information. Replete with data and references. Send for it today!

NUTRITIONAL RESEARCH ASSOCIATES
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D·L·V

Hog Cholera

Vaccine

Modified Live Virus

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Porcine Origin

- Does Not Spread Hog Cholera
- Produces Solid Immunity
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● *Thoroughly tested in the field*



Quality Products of Dependability

SERVING THE GRADUATE VETERINARIAN EXCLUSIVELY

DIAMOND LABORATORIES

DES MOINES, IOWA

NEW 'Antilepto'

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*New, improved immunizing agent
against bovine leptospirosis*

MAJOR ADVANTAGES: High protective titers developed within 7 days. Protection lasts at least 6 months.¹ Stable, potent.

Annual losses from bovine leptospirosis are estimated at over 112 million dollars—25 million dollars greater than losses from bovine brucellosis.² With new 'ANTILEPTO', semi-annual vaccination of beef and dairy cattle will control the spread of the disease—check losses in animals and milk.

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References: 1. Brown, A. L., et al.: To be published. 2. Agricultural Research Service, Losses in Agriculture, June 1954, Table 20, p. 129.



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(Boxer clamp pictured)

BEAUTIFUL EAR TRIMS

EVERY TIME WITH

Faultless Ear Patterns

- Precision built of finest materials
- Designed on the original French curve
- Used by specialists throughout the country

BOXER CLAMP, \$15.00
DOBERMAN CLAMP, \$15.00
GREAT DANE CLAMP, \$15.00
SET OF ABOVE THREE, \$40.00

Including instructions for trimming

Send check or money order to
THREE OAKS VETERINARY HOSPITAL
Three Oaks, Mich.

(CORRESPONDENCE—continued from p. 48)

I am very grateful to the AVMA for granting me Life Membership.

s/G. Dikmans,
377 N. Jefferson St.,
Ionia, Mich.

I express my sincere thanks for the pleasant surprise of Life Membership. It is highly valued.

s/A. J. Dinse,
7619 N. Albina Ave.,
Portland 17, Ore.

I genuinely appreciate the kindness of the Association and regret that physical disability prevents me from attending its meetings and taking an active part in veterinary medicine.

s/W. C. Dye,
723 Westwood,
San Antonio 1, Texas.

My father, Dr. Charles A. Hulbush, has always been very proud of his membership and is very appreciative of receiving the JOURNAL. The day one arrives is a high spot in the month for him and he reads it from cover to cover.

s/Mrs. Joyce H. Brooks,
Burlington, Wash.

I am very appreciative that I will continue to receive the JOURNAL and be allowed to participate in meetings of the Association. Retirement should not mean loss of interest in the welfare and progress in our profession.

s/George H. Koon, Colonel,
V.C., U.S. Army (Ret.),
2018 Noriega St.,
San Francisco 28, Calif.

I wish to express my appreciation and thank everyone who had anything to do with it.

s/Frank R. Knotts,
Stillwater, Okla.

Thank you and all concerned for having honorably shelved me after a number of years of active service.

s/J. V. Lacroix,
Box 872,
Evanston, Ill.

It is something to be proud of and I shall treasure it always.

s/C. D. Lowe,
3429 Oakwood Terrace,
Washington, D. C.

Thank you for my Life Member card. I also deeply appreciate the honor of having served our Association as member-at-large, chairman

(Continued on p. 52)

DISPENSING

Frick, E. J.: No. Am. Vet. 35:902 (Dec.) 1954.

"There is little question that profits from dispensing take up financial slack when practice is slow. Dispensing also pays for the time used in relabeling and preparing good prescriptions. It increases contacts with owners, and proper handling leads to more calls..."

DISPENSING

Minton, O.: No. Am. Vet. 35:825 (Nov.) 1954.

"As to the insinuation that veterinarians do not like to dispense, from conversations at veterinary meetings and other contacts with members of the profession, it is evident that many veterinarians are giving more attention than ever to the dispensing side of their practice.... Actually, the principal economic argument in favor of veterinarians doing their own dispensing is found in the fact that the profit is repeated every time a client returns for a 'refill.' In addition, these return calls help to solidify the veterinarian's position in the mind of the client as the one source on which to rely for veterinary service and advice."

indispensable for dispensing

Terramycin

Department of Veterinary Medicine

Pfizer

PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, N. Y.

TERRAMYCIN ANIMAL FORMULA
FOR MASTITIS 1/2 oz. tube

TERRAMYCIN ANIMAL FORMULA
TABLETS 2-tablet "matchbook" folders

TERRAMYCIN ANIMAL FORMULA
SOLUBLE POWDER 1/2 lb. bottle,
5 lb. bottle, 10 lb. container

TERRAMYCIN EYE PELLETS
100-encased package of 10;
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TERRAMYCIN OPHTHALMIC
OINTMENT 1/2 oz. tube

TERRAMYCIN POULTRY FORMULA
1/2 lb. bottle, 10 lb. container
NEW 1.6 oz. bottle "Baby Chick" size,
protects 100 chicks for first
2 weeks of life

TERRAMYCIN SUSPENSION IN OIL
500 cc. bottle, 100 cc. bottle

TERRAMYCIN OINTMENT
1 oz. tube

NEW 'Antilepto'

LEPTOSPIRA BACTERIN

*New, improved immunizing agent
against bovine leptospirosis*

MAJOR ADVANTAGES: High protective titers developed within 7 days. Protection lasts at least 6 months.¹ Stable, potent.

Annual losses from bovine leptospirosis are estimated at over 112 million dollars—25 million dollars greater than losses from bovine brucellosis.² With new 'ANTILEPTO', semi-annual vaccination of beef and dairy cattle will control the spread of the disease—check losses in animals and milk.

Available exclusively to licensed veterinarians.

Supplied: 25-cc. (5-dose) and 100-cc. (20-dose) vials.



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References: 1. Brown, A. L., et al.: To be published. 2. Agricultural Research Service, Losses in Agriculture, June 1954, Table 20, p. 129.

(CORRESPONDENCE—continued from p. 50)

of the Executive Board, and as President in 1934-1935. The awarding of Life Membership to my brother [see JOURNAL, March, 1955: 45] may establish a record of two brothers receiving it in the same year. Trusting that the AVMA will continue to grow and prosper as "Time Marches On."

s/R. S. MacKellar, Sr.,
329 West 12th St.,
New York City.

• • •

During my active years, I valued my membership, for the JOURNAL was always a great source of new knowledge. Now, in retirement, the honor not only enhances my self-esteem but the monetary savings vindicates my Scottish instincts. Over the years I have tried to make some small contribution to the professional and fraternal organizations to which I belong. Please accept the enclosed small contribution for the benefit of the Research Fund.

s/C. W. McIntosh,
91 Hopewell Ave.,
Ottawa, Ont.

(Continued on p. 56)

KINGAN INC. introduces to the Veterinary Profession

KING'S FARE

TO BE USED UPON DIRECTIVE OF A VETERINARIAN



*Recommended as a
Dietary Prescription for*

- FORCED-FEEDING
- GASTROENTERITIS
- ANIMALS NOT TOLERATING SOLIDS
- YOUNG ANIMALS INTOLERANT OF MILK

**A SPECIAL PRESCRIPTION LIQUID
DIET FOR INVALID FEEDING**

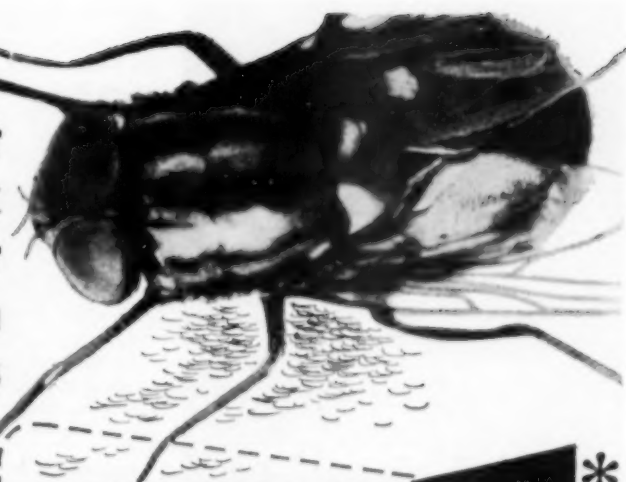
bland, highly palatable fluidized suspension containing lean beef skeletal muscle blended with vegetables.



Prepared under supervision of the Meat Inspection Branch of the U. S. Department of Agriculture.

for sample and information address **KINGAN INC., P. O. Box 386, Indianapolis**

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livestock
against
screw worm
infestations**



WHITE SMEAR **Plus** *

a creamy emulsion

An effective treatment for all domestic animals. Kills screw worms *and* flies that settle on wound after treatment. Prevents reinfestation for 8-10 days. Apply on new cuts, etc. to prevent infestation. Easy to apply. Free flowing—non-staining.

Supplied in
4 oz. bottles (dauber)
12/4 oz. bottles \$5.25
1 gallon..... 7.70



the PLUS stands for Sulfanilamide—an excellent bactericide added to expedite healing of the wound after the screw worms are killed. Lessens the chance of bacterial infection.

A BALANCED FORMULA

Active Ingredients:


Gamma Isomer of Benzene Hexachloride (Lindane).....	3% w/w
Sulfanilamide	5% w/w
Pine Oil	35% w/w

Inert Ingredients: Mineral Oil, Emulsifier, Silica Gel.



SERVING GRADUATE VETERINARIANS EXCLUSIVELY

**THE
NATIONAL LABORATORIES
CORPORATION
KANSAS CITY**



dispense

Terramycin

BRAND OF OXYTETRACYCLINE

for
**FOLLOW-UP
THERAPY**

Dr. Graham Joins Upjohn Research Staff

Walter R. Graham, D.V.M., M.S., has joined the research staff of the Upjohn Company, Kalamazoo, Mich., and will work in the pathology section of the Department of Pharmacology, according to Dr. R. S. Schreiber, vice-president and director of research.

Dr. Graham is a native of Rifle, Colo., and a graduate of Colorado A. & M. College, on whose staff he was before joining Upjohn.

Commercial Solvents Discontinues Its Veterinary Pharmaceuticals

Effective in February, 1955, Commercial Solvents Corporation transferred all business relating to their pharmaceutical products, including their veterinary medical products, to the ethical pharmaceutical firm of Reed and Carnick, Jersey City 6, N. J.

Commercial Solvents will continue to supply bulk pharmaceutical products to the industry through established channels.

The springbok, an antelope-like animal, has been known to leap 12 or 13 feet into the air when frightened.—*Sci. News Letter*, Jan. 1, 1955.

Produced for
exclusive use of the
Graduate, Licensed
Veterinarian



MEMBER:
Associated
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IN THE GRAIN BELT CIRCLE OF QUALITY

The rigid standards embodied in Grain Belt products have been applied to a new line . . . Affiliated. These products, too, are of that high quality you have come to expect from Grain Belt. Our reputation, gained through 35 years of continuous service, is fully behind the entire Affiliated line. We invite you to use these products in full confidence. • The Grain Belt Supply Company, which has served you faithfully for many years, is proud to take part in bringing you the new Affiliated line.

GRAIN BELT SUPPLY COMPANY, 4902 South 33rd Street, OMAHA, NEBRASKA

We Proudly Present the New Model of Our



Electromagnetic

METAL

DETECTOR

D.P. No. 822 697

**a combination set with
both optical and
acoustical
indications**

Our previous model with optical indication was recognized as the best Metal Detector on the market. Our new model incorporates the latest in electronics!

You can regulate the extremely high sensitivity according to your needs; you can eliminate extraneous interferences to a high degree without impairing the detecting ability of the instrument. A complete elimination is, of course, impossible. We are especially glad to be able to offer this highly perfected diagnostic combination set at almost the same price. Your distributor is ready to furnish all detailed information and to deliver without delay.

DISTRIBUTORS

Albany Serum Co., Albany, Ga.
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Miller Vet. Supply Co., Fort Worth 1, Texas
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Northwest Vet. Supply Co., Oregon City, Ore.
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Destroys fungi; sarcoptes scabiei canis; demodex canis; mites; fleas; lice. Repels ticks. Non Staining; not greasy; has no objectionable odor, destroys odors of external origin. Non Toxic; may be used daily in recommended dilution. Concentrated; one gallon makes four.

Gallon

\$13.95

Makes 4 gallons

Quart

\$4.00

Makes a gallon

**Available nationally through
well known Distributors**

Write for free sample

Osco Chemical Company, Inc.

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Atlanta 1, Georgia**

NEW 'Antilepto'

LEPTOSPIRA BACTERIN

*New, improved immunizing agent
against bovine leptospirosis*

MAJOR ADVANTAGES: High protective titers developed within 7 days. Protection lasts at least 6 months.¹ Stable, potent.

Annual losses from bovine leptospirosis are estimated at over 112 million dollars—25 million dollars greater than losses from bovine brucellosis.² With new 'ANTILEPTO', semi-annual vaccination of beef and dairy cattle will control the spread of the disease—check losses in animals and milk.

*Available exclusively
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Philadelphia 1, Pa.
DIVISION OF MERCK & CO., INC.

References: 1. Brown, A. L., et al.; To be published. 2. Agricultural Research Service, Losses in Agriculture, June 1954, Table 20, p. 129.

(CORRESPONDENCE—continued from p. 52)

Many thanks for the Life Membership. I appreciate the generous attitude of the AVMA.

s/H. C. Millar,
Asbury Park, N. J.

• • •

It has been an honor to have been a member and I fully appreciate being designated a Life Member.

s/M. W. McGuire,
Terre Haute, Ind.

• • •

It has been a pleasure and honor to belong to and support an "up and going" organization such as the AVMA. May it long continue to advance veterinary science.

s/George P. Rebold,
1626 Sacramento St.,
Berkeley 2, Calif.

• • •

I express my appreciation for Life Membership. I am still interested in the progress in all phases of veterinary work and the JOURNAL is the best means of keeping in contact.

s/John Redmond,
P. O. Box 637,
Dade City, Fla.

• • •

Thanks for your letter received this morning and the Life Membership card.

s/C. Ross,
Middletown, N. Y.

• • •

Life Membership is a great source of satisfaction to me. I shall enjoy receiving the JOURNAL. I am hoping very much to attend another AVMA meeting.

s/T. A. Sigler,
Greencastle, Ind.

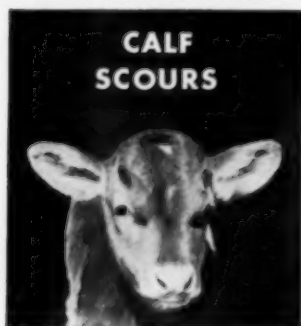
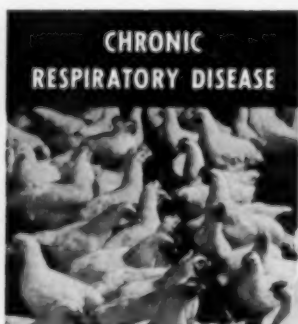
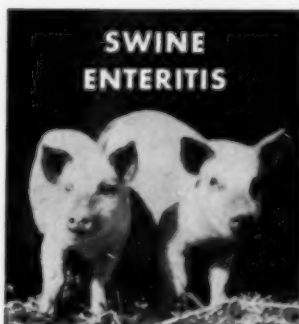
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Armour Veterinary Laboratories says that more than 1,000 three-color posters, urging farmers to "Consult Your Veterinarian Regularly," dotted the rural highways of the United States during the months of February and March. Locations of the poster boards were chosen on the basis of the highest traffic highways in those counties with better-than-average livestock population.

Mr. Edward J. Hennessy, sales manager for Armour Veterinary Laboratories, who originated the campaign, says the posters are "Armour's way of saying thanks to the doctors." Mr. Hennessy adds, "Without their help, we could never have grown to our present position in the industry. We want to call attention to the need for regular consultation between farmer and Veterinarian." The poster campaign, he says, is another way of combatting livestock disease through public education.

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VETSTREP Granules in drinking water combat those organisms most frequently responsible for enteritis in hogs, calves, and dogs. Extensive field trials have confirmed that VETSTREP clears up swine enteritis and calf scours in one to five days. In other studies, VETSTREP Granules have proved highly efficacious against blue comb in turkeys and nonspecific enteritis in both chickens and turkeys.

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*New, improved immunizing agent
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MAJOR ADVANTAGES: High protective titers developed within 7 days. Protection lasts at least 6 months.¹ Stable, potent.

Annual losses from bovine leptospirosis are estimated at over 112 million dollars—25 million dollars greater than losses from bovine brucellosis.² With new 'ANTILEPTO', semi-annual vaccination of beef and dairy cattle will control the spread of the disease—check losses in animals and milk.

Available exclusively to licensed veterinarians.

Supplied: 25-cc. (5-dose) and 100-cc. (20-dose) vials.

References: 1. Brown, A. L., et al.: To be published. 2. Agricultural Research Service, Losses in Agriculture, June 1954, Table 20, p. 129.



Philadelphia 1, Pa.
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(CLASSIFIED ADS—continued from p. 44)

Veterinary hospital for sale or lease in southeast Florida on U.S. highway 1; capacity, 70 dogs. Established 15 years. Address "Box M 1," c/o JOURNAL of the AVMA.

Well-equipped small animal hospital for sale; air-conditioned, established 18 years. Astoria, Long Island. Attractive terms for right man. Address "Box M 27," c/o JOURNAL of the AVMA.

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(Continued on p. 62)

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Pfizer

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(Continued on p. 64)

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Bursal or Tendon Lameness**



Single Bottle.....	\$2.00
3 and 1 free.....	5.00
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**CLIENT
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(CLASSIFIED ADS—continued from p. 62)

Miscellaneous

For sale—five new Wynkoop electric dehorning saws at \$160 each. Address Dr. R. D. Hoffman, 325 S. Richard St., Bedford, Pa.

For sale—Motorola 10-watt base station complete with antenna, clamps, and 100-ft. cable. Extra equipment, used very little. Address Merrill Ranck, D.V.M., Prospect, Ohio.

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(Continued on p. 66)

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The multi-injector's third hand



Another accurate smooth working ground glass barrel — leak proof metal plunger instrument with many possibilities. Adjustable for any capacity. By attaching one end of a rubber tube to the self-filling syringe and the other to a bottle of serum or vaccine any number of quick 1/4cc to 5cc accurate dose injections can be made. The instrument is operated with one hand. Anyone who injects a large number of animals will find the Self-Filling Syringe will pay for itself both in labor and serum saved after the first day's use.

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Literature upon request

Inquire at your nearest veterinary dealer or wholesaler about this new improved outstanding product.

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for PROVEN Hog Cholera Protection

- Can't spread Cholera
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- Available in
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(Modified Live Virus—Porcine Origin)



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The organisms are killed—
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Supplied in
50cc and 250cc vials
Dose is 5 to 10cc



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**precision
veterinary
equipment**



**durable, metal sheathed
instrument/serum cases**

Baked black enamel over steel with brass trim. 5 standard models; light weight, yet built to take knocks! See folder N-1 for sizes, prices.



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Write for folder N-2 on our new fiberglass kennels. Read also about our new "do it yourself" plasti-plate material which renews old kennels, plastic-plates new ones. Inexpensive, easy to use.



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hi-current electric firing iron

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☐ folder N-1 cases

☐ folder N-4 OB forceps

☐ folder N-2 glas-kennels

☐ folder N-5 range brand

☐ folder N-3 "B" irons

☐ folder N-6 firing irons

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(CLASSIFIED ADS—continued from p. 64)

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NEW 'Antilepto'

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*New, improved immunizing agent
against bovine leptospirosis*

MAJOR ADVANTAGES: High protective titers developed within 7 days. Protection lasts at least 6 months.¹ Stable, potent.

Annual losses from bovine leptospirosis are estimated at over 112 million dollars—25 million dollars greater than losses from bovine brucellosis.² With new 'ANTILEPTO', semi-annual vaccination of beef and dairy cattle will control the spread of the disease—check losses in animals and milk.

Available exclusively to licensed veterinarians.

Supplied: 25-cc. (5-dose) and 100-cc. (20-dose) vials.



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Which is not simply factories, farms, or gold—but millions of a particular kind of people called Americans. And it is these people—people like yourself—who stand behind what is probably the world's finest investment: U. S. Series E Savings Bonds.

To buy these Bonds is to join them in their proud confidence of their country and its future—and to protect your own personal security as well.

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The policy, which was developed especially for Association members two decades ago, provides expert defense against claims and suits arising out of the care and treatment of animals, and will pay, to the extent of the policy limits, all expenses and damages resulting from unfavorable verdicts.

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Write at once for an application and descriptive folder.

American Veterinary Medical Association

600 So. Michigan Ave., Chicago 5, Ill.

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An efficient, safe and practical product for the prevention of erysipelas in swine and turkeys.

Chemically killed — whole culture — of highly antigenic strains of *Erysipelothrix rhusiopathiae* — precipitated and adsorbed by aluminum hydroxide, and concentrated for maximum immune response.

Lockhart Erysipelas Bacterin is a killed culture, incapable of setting up new foci of infection. It can be used in states where *Erysipelothrix Rhusiopathiae* Vaccine (culture) is not permitted, thus lending itself as a natural for swine erysipelas control in the so-called fringe area.

Erysipelas Bacterin can be given alone or simultaneously with the modified hog cholera vaccines.

Dosage: Swine

5 cc. Subcutaneously in animals under 100 lbs.

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1 cc. for birds under 10 lbs.

2 cc. for those over 10 lbs.

Best results are obtained when birds are 8 to 10 weeks old.

2. Anti-Swine Erysipelas Serum

There is none produced better than Lockhart.

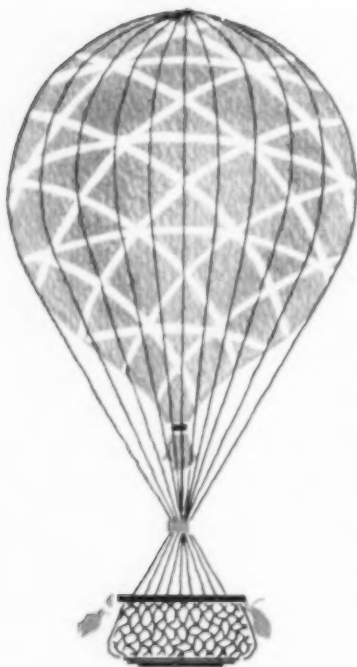
Every effort is being extended by Lockhart to insure adequate supplies of THE Anti-Swine Erysipelas Serum for the spring farrowing season. Order from your suppliers today — and insist upon *Erysipelothrix Rhusiopathiae* Vaccine Desiccated by Lockhart as the companion product.

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